SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

ON INCREASED SAFETY IN WORKING COAL.

BY SAMUEL FIRTH, M.A.

In many of the numerous accidents which yearly occur in our coal mines there is difficulty in tracing them to their proper cause, and this is probably due, in a great measure, to the many different methods of working coal which exist, each requiring its own special rules of safety, and by the want of which, or by ignorance of them, risks are incurred which may bring disasters, without any increase of knowledge for their future prevention.

But there are many dangers which are more or less general to all systems of working, and as long as the sources exist accidents will happen; rules, however stringent, will never entirely prevent them, for men are fallible, and if not wilfully careless they are apt to be misled by the appearances around them. It would be well for us, therefore, to endeavour to find out that system of working which comprises the fewest sources of danger, and if we can do that then consider the pros and cons for its general application; and although we may never hope entirely to prevent ordinary accidents incidental to a dangerous calling, yet we may with advantage consider whether much greater general safety may be obtained or not.

With a view of suggesting that increased safety can be obtained, I propose, first, to consider in a few words how far two modes of working which have hitherto obtained have an influence in increasing or lessening the liability to accident, and shall compare, with this object, the "bord and pillar" system and "long wall proper"—*i.e*, keeping all the coal away in long straight faces. I limit my comparison between these two methods because they are the most distinct, and because all other systems present, more or less, points of resemblance to one or the other.

In "bord and pillar" there is liability to accident from the following causes:—

1.—Deranged ventilation, owing to it being split up into a great many parts, traversing long distances, and turning many corners.

2.—That when stallmen do all branches of the work themselves—holing, blowing down, filling, and propping—there is apt to be carelessness, especially being paid, as they think, only for the coal sent out, they are proved often to run many risks, rather than spend a little extra time to make all safe as they go along.

3.—That there is difficulty in exercising proper supervision over the men and workings, isolated as they are in different parts of the mine.

4.—That when pillars of coal are left they prevent a thorough subsidence of the roof, and cause breaks or hollows to be left in the goaves, and these become often full of gas, which may at any time blaze out. Moreover, there is difficulty in ventilating the goaves.

5.—That when small coal mixed with pyrites is left in the partially open goaves there is danger from spontaneous combustion.

6.—The use of gunpowder is almost universal to bring down the coal.

In "long wall" there is less liability to accident as compared with "bord and pillar," on the following grounds:—

1.—The same amount of ventilation is more effective and safer, from its greater simplicity.

2.—It presents a much better opportunity for a judicious division of labour; this can be done by having relays of men to do the holing, packing, filling, and where necessary blowing down. Thus each relay having its distinct branch of labour, there is not the liability of any part of the work being carelessly performed.

3.—That as the workings and men are more concentrated a better supervision can be exercised.

4.—That by a general subsidence of the roof the goaves become closed up, allowing no reservoirs for gas. Moreover, the goaves can be ventilated as required.

5.—That where there is a known danger from spontaneous combustion it can be obviated by driving to the boundary and working home.

6.—The use of gunpowder is not universal to bring down the coal.

In "long wall," however, the miner is more liable to accidents from falls of coal and roof than in "bord and pillar" work, for the coal being unsupported by pillars has a greater tendency to part from the roof, and the depth of undercutting being, in some cases, 5 or 6 feet the miner is often entirely under the coal, and liable at any moment to be injured by the falling mass. This great depth of "holing," however, sometimes enables the coal to part from the roof without having recourse to blasting, but gives a great width of roof to be supported, and is apt to bring this down with the coal or separately.

Owing, however, to the great height of manual "holing" at the face of the coal, its arched form, and irregular depth, the coal does not always part from the roof by its own weight, and the use of gunpowder is more or less requisite.

We thus see that, however advantageous in other respects, there is still danger in "long wall," from—

1.—Falls of coal.
2.—Falls of roof.
3.—The use of gunpowder (more or less).

And it is from these three sources of danger that the greatest number of accidents arise.

Now, I beg to suggest that by working "long wall" by coal-cutting machinery the above dangers are almost entirely obviated. For—

1.—The workman is removed from danger by falls of coal.

2.—A less depth of undercutting being necessary to bring down the coal by mechanical means than by hand labour, there is a less width of roof to support, hence less risk of its being brought down with the coal, or separately; and the working face being straighter, the roof can be supported with greater regularity.

3. *The use of gunpowder is unnecessary*, for the coal being less cut away at the face, and the back of the groove being straight, along with other reasons too numerous to mention, the parting of the coal from the roof by its own weight can be assured.

I should at greater length have entered upon the theoretical reasons of this part of my subject, but I deem that unnecessary, as the statements I have made are being verified by practice, and there are several of the members who have seen, and are obtaining, similar results by the adoption of long wall, coupled with coal-cutting machinery.

I might, however, just observe that this combination enables us to use the forces of nature, so that they assist our operations instead of impeding them, and that by these means it is possible for miners to work and win coal without the operation being a perpetual fight for life.

The sources of danger remaining would be those only which a strict attention to Government rules should hold in check, especially when some of the more stringent rules, which are now before the Legislature, become law.

THE SCOTCH IRON TRADE—No. VII.

THE SHOTTS AND CASTLEHILL IRONWORKS.

In the Supplement to last week's Journal we referred to the mineral fields which the Shotts Iron Company had opened up. From the mining to the manufacture of iron is a natural and easy transition, and are now come to speak of the Shotts Ironworks and their subsidiary establishment at Castlehill.

It was in the year 1802 that the first furnace was put in blast at Shotts. The founder of the works was John Baird, of the Canal Basin, Glasgow, and he and his successors carried them on with varying success until the year 1824, when they passed into the possession of a joint-stock company. For a number of years there was only one furnace in operation, and its production was only equal to 2000 tons per annum, being less than a single furnace will now produce in a month under the improved conditions of hot-blast and more economical management. While the iron was smelted by the aid of cold blast, it required 10 tons of coal to produce a ton of pig-iron, and so limited was the productive capacity of the works up to the year 1824, that the directors of the joint-stock company thought it worth while in their report to the shareholders to introduce a special paragraph, congratulating them on the works having produced 50 tons more than they did on the previous year. Covering about 30 acres of ground, the Shotts Ironworks comprise four blast-furnaces, and a large foundry. Two of the furnaces are 50 ft. in height, and 17½ ft. diameter at the top of the bosh. The other two are 45 ft. high, and 16 ft. diameter of bosh. The blast is raised to a temperature of between 800° and 900°; and the charge used is 14 cwt. of coal, 16 cwt. of charcoal, and 3 cwt. of limestone. Two engines, one a beam and the other direct-acting, supply the blast to the furnaces. The blowing-cylinder of the beam-engine is 90 in. diameter, the stroke of the piston being 7½ ft. The blowing-cylinder of the other engine has likewise a diameter of 90 in., the stroke being 9 ft. The beam-engine was introduced in 1842, and the direct-acting engine, which is built from a patent of Mr. Neilson, of Hyde-park Locomotive Works, Glasgow, was added in 1857. The peculiarity of the latter engine lies in the fact that it has two side cylinders; but the principle was more novel than successful, and we understand that this was the first and last engine made of its kind. The gases of the blast-furnaces are utilised in a manner which, if it is not peculiar, is at least rarely adopted in Scotland, the Summerlee Ironworks being, so far as we know, the only other works in the country that adopt the same plan. By means of an annular flue, they are carried off, 8 ft. below the charging ports, to the heaters below. As yet, the utilisation of gases has only been applied to two furnaces; but it is intended, in course of time, to alter the others, so as to work on the same principle. Besides the large economy of fuel which it is the means of effecting, this plan of utilising the furnace-gases ensures a more regular and an increased heat. It is about 18 months since the idea was first put into practical and successful shape at Shotts, although experiments with a view to the utilisation of the gases had been made a number of years previously, and had to be abandoned after a great expenditure of labour and money. Its ultimate triumph is ascribed to the fact that the gases are taken off at a lower part of the furnace than formerly, thereby preventing them from mixing with the air, and getting rid of the dangers of explosion. It has been proved to a certainty that the use of this principle saves about 10 cwt. of coal per ton of pig-iron smelted in the furnace, besides all the dross or small coal required for heating the heaters. As we have indicated, it is intended to alter the other two furnaces so as to utilise their gases in the same way, and when this is done it is expected that the heat of the gases will be adequate to supply the boilers and blowing-engines, as well as the heaters. The average consumption of coal over the four furnaces is 35 cwt. per ton of pig-iron made. The average production is 750 tons per week for all the furnaces. All the furnaces are open-topped. Another furnace is now in course of erection—the foundations having been completed—which is to be built to the height of 50 ft. This furnace will add, when in operation, nearly 10,000 tons per annum to the production of the works. The heaters for the new furnace are to be of the usual kind, and they will be heated by the furnace-gases, which will be carried off by pipes 2 ft. diameter. The furnaces are all filled off a level at the tunnel head, an arrangement which, while it obviates the use of a lift, also precludes the possibility of increasing their height. Considering the advantages that are now claimed for furnaces of exceptional height, this may be regarded as a drawback. The water for the boilers and other purposes is mainly obtained from the pits, and there is a large reservoir near to the furnaces, where a supply is always kept in stock. The Shotts iron is sent to all parts of the world, but it is chiefly in request in the German and Russian markets. It stands very high among Scotch brands, the market price being now 105s. for No. 1, and 95s. for No. 3. It is upwards of 30 years since it stood at anything like this figure. As a rule, the Shotts pig-iron is shipped from Leith, but considerable quantities are also sent to Grangemouth and Glasgow for exportation. The limestone used at Shotts is found at a distance of three miles from the works, but the ironstone and coal is worked in the immediate neighbourhood. Between the foundry and the blast-furnaces the consumption of coal is about 120,000 tons per annum. About the foundry there are no features calling for special remark. It is adapted for all kinds of castings, the shops are extensive and convenient, although, being rather old, they are not built in the most modern style. Some idea of the extent of the work done in the foundry will be formed from the fact that the quantity turned out ranges from 3000 to 4000 tons per annum, of which 20,000*l*. worth are sold, and 3000*l*. worth is used for the company's mines and works. At present there is a large quantity of work on hand, including a number of vertical retorts for the manufacture of crude oil at a new work which the Uphall Mineral Oil Company propose to establish at Hopetown.

The Shotts Iron Company founded the Castlehill Ironworks, near Carluke, in 1837. There are three furnaces at this establishment, only two of which are in blast at the present time, the other having been laid off in consequence of the unsettled state of the miners and ironworkers in the district. All three furnaces are the same height—45 ft.; and their diameter at the top of the bosh is 17½ ft. for one, and 16 ft. for the other two. The charge used is 15 cwt. of coal, 13 cwt. of ironstone, and 3½ cwt. of limestone. The present production of the works with two furnaces in blast is at the rate of 350 to 360 tons per week. Like the Shotts furnaces, the furnaces at Castlehill are charged off a level at the tunnel-head. The blast is obtained from two blowing-engines. The diameter of the blowing-cylinders is 6 ft. 6 in. and 7 ft. 6 in. respectively, the stroke of both being 7 ft. They are both beam high-pressure engines, and combine all the excellencies of their class. The clayband ironstone used at Castlehill is raised in the immediate neighbourhood of the works. The coal is obtained from Morningside Colliery, 2½ miles distant. This colliery is 90 fms. deep, and its present yield is 60,000 tons per annum. As for the blackband ironstone used at Castlehill, it is brought from Inzevar, in Fifeshire, where the Shotts Company lease a considerable tract of mineral fields.

Between their ironworks and their collieries the Shotts Iron Company employ between 2000 and 3000 workmen; and, in the words of a report made upon their works by competent mining engineers, we may conclude by saying that "few, if any, of the ironworks in Scotland have at their command such an ample supply of ironmmaking minerals, so moderate in cost and excellent in quality, or are in a position to look forward so long to being able to produce high-class pig-iron at so small an outlay."

IRONWORKS AND COLLIERIES IN YORKSHIRE.

THE CALDER VALE WORKS, WAKEFIELD.

In what may be termed West Yorkshire proper, and of which Wakefield is the centre and capital, there are several important iron-making establishments, situated so as to realise the undoubted advantages to be derived from close proximity to smelting furnaces and excellent and extensive coal mines. The largest of those establishments is that of Mr. S. Whitham, known as the Calder Vale Ironworks, where are produced rails, plates, sheets, and every description of merchant iron. With one exception, that of the Bowling Works, we believe, there are more puddling furnaces than at any other place in the district, including Leeds and Bradford.

The works are in the lower part of the town, divided from the main thoroughfare by the railway and railway station, to the former of which there is a siding. On entering the gates we passed to the right an extensive and well laid out *suite* of offices, and thence proceeded to the main building, a well arranged structure for efficiently carrying on an extensive business, with due regard to the comfort and convenience of the workmen. A large trade is done by Mr. Whitham in plates for boilers and other purposes, for the turning out of which there is an excellent 21-in. train mill, worked by a 50-horse power condensing-engine, the boilers being of the ordinary description, but fitted with Galloway's patent tubes. The same engine and boilers work a 19-in. train sheet-mill.

Passing on to another part of the establishment, we find a very good and useful merchant-mill, a 16-in. train, for bars and angle iron, and where rails up to 80 lbs. are occasionally rolled. The motive power is given by a 40-horse power engine, made at the Union Foundry, Bradford. The boilers are of the ordinary Cornish type, double flued. In the same locality there is an 18-in. train-forge rolls, worked by a 40-horse power engine, with boilers similar to those used at the plate and sheet mills. The same engine also works a rather old-fashioned but very useful machine or implement known as crocodile squeezers. In the same locality there are also a second pair of forge rolls, 18-in. train, from which a good deal of the material is turned out, and at no great distance there is a 9-inch train rod mill kept constantly going. The two mills are driven by means of an excellent 40-horse power engine. The power is obtained from three Cronish boilers, and there is also an auxiliary boiler for generating steam joined with them. The engine also works a fine saw for cutting rails, &c. In connection with the plate mills are a pair of large sheers, made by Tannett and Walker, of Leeds, with an eight-horse power engine and fittings. For other necessary work there is a 12-horse power engine and fittings, to which is connected some of Root's patent blowers. In other parts of the buildings are engines for working the machinery, together with the necessary boilers, amongst these former being one of 6-horse power for punching and shearing machines, some of them being made by the well-known firm of Tannatt and Walker. One of the large pairs of shears are of considerable power, cutting with ease plates when cold up to fully 1 in. in thickness. There are also a pair of three-ton steam-hammers by the firm just named, worked by the engines engaged in other work. In various parts of the works there are all the necessary workshops and appliances for finishing the productions of the different mills, such as lathes and planing-machines by well-known makers, together with four blacksmiths' fires, &c.

For some particular description of work, charcoal iron is made on the premises, and for that purpose there is a 12-horse power engine and boilers, with a blowing-machine. There is also a very compact machine for bending tyres and hoops, worked by a small engine. We saw it whilst bending tyres, and nothing could be better adapted for such a purpose, so far as regards expedition and ensuring the completeness of the circle of metal.

The quantity of puddled iron consumed is considerable, seeing that the requirements are such at the present time that producers are scarcely able to keep pace with the demand made upon their resources; and Calder Vale is no exception to the rule. There are no less than 29 puddling-furnaces—13 of them single, are worked by blast, driven by Root's patent blower. Of ordinary pig the consumption at present is upwards of 400 tons per week, and it is selected principally from the furnaces at West Ardsley, Cleveland, and Derbyshire. It is brought direct by rail, and taken from thence by a locomotive belonging to Mr. Whitham, which is kept fully going either in receiving metal and coal, or in conveying the manufactured iron on to the main line for exportation to different parts of the kingdom; for although the River Calder runs close to the works, and is, of course, taken advantage of, yet the principal business is

done by rail. About 350 pairs of hands are employed at the mills, furnaces, &c., we may say that there are several fine chimney stacks in connection with the works, which with those adjoining them, are most conspicuous. Mr. Whitham, the proprietor, courteous alike to all, has the reputation of being an excellent employer, and, despite the commotion which prevailed at many of the works around up to a recent period, has maintained a good understanding with his men, so that there has been no interruption to his business.

MINES REGULATION BILL.

SIR,—One of the first considerations on the part of a Government should be that the lives of the people be protected under all circumstances. In the case of coal mining, I regret to say, this has not had sufficient attention from the authorities in this country, or we should not have so many calamities occurring from negligence or ignorance on the part of the management. It is necessary that those in whose hands the lives of so many individuals are should be held responsible, and that they should have a guarantee of their being capable of such responsibility. "G." asks, "Who buys the timber?" Now, what matters it, so long as the person in charge sees that the quality and quantity be sufficient. Surely "G." would not risk so many lives for the sake of an exceptional case of ability, as he describes. It does seem hard to lessen his chance of promotion, but still he can arrive at a very good position without being interfered with by Government regulations.

It is a well-known fact that far fewer accidents occur from falls of the roof in districts where the timbering is done by special men, told off for that purpose alone; yet the Government has taken no means up to the present to prevent hewers from doing this work. The Durham district is far freer from such accidents than most others, because they have adopted a good system, which ought to be more generally used. "G." complains that certified persons will be wanting in experience. I think we can compare the case favourably with ship captains, for we often find that persons holding certificates as captains occupy the positions of first, second, and even third and fourth officers on ship board. Why should not this be the case with mine managers, who would gain practical knowledge as they rise to higher positions, even though they hold certificates?

According to "Nitram," we can learn much from the Germans, but still their system seems at fault, for "Nitram" mentions that the responsible party in his case seldom examines the workings, and, therefore, cannot be in a position to bear the responsibility. It is like one man being responsible for another's actions. In "Nitram's" case I should say he should be responsible, since he has immediate control of everything. I hope the measures being taken by Government will have the effect of protecting the lives of the miners, who, I regret to say, will not take the trouble in many instances of protecting themselves.—*Coatbridge Oilworks, Coatbridge, April* 24. J. A. M.

CERTIFICATED OFFICERS FOR MINES.

SIR,—The suggestions made by Messrs. Stephenson and Keightley with reference to the appointment of the examining board for mine officers, appear so thoroughly sound and practical that they cannot fail to obtain attention; yet I think there are certain modifications which would improve them. The coalowners should be compelled to appoint the two gentlemen from amongst their number who are or have been within two years practically engaged in the management of collieries; for it would obviously be unjust to those seeking certificates and dangerous to the workmen to permit gentlemen who, although deriving income from their collieries, seldom even visit them, and invariably place all control in the hands of a manager, to form part of the examining board. Of course, if we could have men like Mr. George Elliot, or Mr. John Lancaster, there would be nothing to complain of; but I had the pleasure to descend a pit at Wigan with a gentleman who formed one of the party of the North of England Institute of Mining Engineers invited to Manchester by the Lancashire and Cheshire Coalowners' Association, and this gentleman stated that although he had been a coalowner nearly all his life he had never before been underground; he thought it cheaper to pay a manager 500*l.* a year to manage the business than to risk killing his workmen by himself attempting to do what he did not understand and had no taste for. Now I think that in such a case as this it would be better to let the manager sit at the examining board as representing the coalowners, and I do not think the coalowners could reasonably object.

I would ensure current practical knowledge in the other members of the examining board by a similar process, the mining engineers, the underground colliery managers, and the working miners should each be compelled to appoint their two men from amongst those who have within two years, and for 12 months consecutively, earned their livelihood as an officer or workman of the class they are to represent. For example, no man should be entitled to a seat at the board as an underground colliery manager unless he has, for one of the two preceding years, actually had the underground management of a colliery. The same for the mining engineers and for the working miners. The object of this is to prevent the increase of the class of "professional representatives" who are ruining trade as fast as they can, although all they care about is to obtain contributions so that they can live without working. Another thing is that I think the person representing the Secretary of State should be the Government Inspector of the district, and that of the other members of the board four should retire each year (one of each class), and should not be re-eligible. This would ensure always having fresh blood in the board, and would incite men to exert themselves to obtain a claim to election, so that the work would be in all respects better done throughout the colliery, and additional safety to life would result. The evil of the constant re-appointment of examiners has long since been discovered in connection with collegiate examinations, and in the case of collieries where life is at stake that evil must be tenfold greater.

I cannot conceive that all the trouble and expense of revising lists of voters is at all necessary. For ascertaining the qualification of mine owners the Government Inspectors' returns would be ample; the mining engineers and the underground colliery managers could prove their qualification by presenting their certificates when tendering their votes; whilst double voting could be prevented by requiring each voter as he votes to deposit his certificate until after the election is concluded. As to the workmen, every miner receiving man's wages should have a vote, and the pay-clerk at each colliery might be empowered to declare the number of men employed, and obtain the required number of voting tickets, so as to distribute them to the men on the pay-day preceding the election.

Such I believe would be a fairer and cheaper way of certificating officers than any hitherto proposed, but it must not be understood that I am in favour of certificated officers in mines, for I am quite sure the sacrifice of life under them would be much greater than at present. If I were asked whether I would prefer to work as a coal hewer with Thomas Stephenson or Benjamin Keightley as underground viewer, or with an associate of the Royal School of Mines, wanting their experience, but holding the certificate of the best examining board that could be appointed, I would unhesitatingly choose the practical men. The men of the class alluded to by your correspondent "G.," whose letter appears immediately under that of Messrs. Stephenson and Keightley in last week's Journal, always make the best overmen and managers, and I am convinced that Mr. Bruce's Bill would exterminate this valuable class of officers altogether. I trust that the certificating clauses will be altogether expunged from the Bill; but if they must be retained I think care should be taken no one can make a trade of the examinership.

April 23. —— UNDERGROUND MANAGER.

PUDDLING BY MACHINERY.

SIR,—Much misapprehension seems to prevail with regard to the negociations between certain English ironmasters and Mr. Danks, and hence it is stated that the breaking off of the negociations is little short of a scandal, and that the ironmasters have acted very shabbily in the matter; yet, when all the facts of the case are considered, it is extremely difficult to see how the ironmasters could have acted otherwise than they have done, although Mr. Danks is certainly to be pitied for having been placed in so unenviable a position.

The ironmasters entered into a *provisional* agreement to purchase certain rights which Mr. Danks offered for sale for 50,000*l.*, and a certain time was fixed for the ratification or abrogation of that provisional agreement. The ironmasters decided to abrogate it, and although until an absolute agreement was entered into they could not be bound, and, therefore, it is scarcely fair to enquire into the motives which led to their decision, it may be well, whilst admitting that Mr. Danks has acted in a thoroughly straightforward and *bona fide* manner throughout, to ascertain whether the ironmasters can fairly be accused of acting otherwise. In the interval between the making of the provisional agreement and the date fixed for ratifying it or otherwise, the ironmasters naturally endeavoured to ascertain whether Mr. Danks really possessed the rights he claimed, or any rights worth the 50,000*l.* There was, of course, no intention on the part of the few ironmasters who were parties to the agreement to pay Mr. Danks the 50,000*l.* out of their own pockets for the benefit of the British iron trade, and Mr. Danks well knew that the agreement was made *provisional*, so that the necessary enquiry might be made. Now the hardship which Mr. Danks has to endure is the more mortifying, because every ironmaster in the kingdom knows that Mr. Danks had a good patentable invention. Many ironmasters, moreover, would have been willing to contribute their proportion of the purchase money for his rights if they could make those rights of commercial value, by securing to themselves some advantages not possessed by the trade generally.

This they found they could not do, for they were advised that Mr. Danks's patent was not valid, and that Mr. Danks's invention, which they were willing to buy, is not patented. This is regretted as much by the ironmasters as it can be by Mr. Danks, because it is well known that those who work a patent, and pay the inventor royalty for the right to do so, frequently gain more than the inventor. If Mr. Danks can prove that under his patents he can secure to the gentlemen who entered into the provisional agreement the exclusive rights he promised none will, I am sure, be more ready than they to pay him the stipulated amount, but to expect that they will pay 50,000*l.* for what their competitors will use for nothing is rather too much.—*April* 23. FAIR PLAY.

TIN MINING IN THE STRAITS OF MALACCA, &c.

SIR,—Three countries only on the face of the globe are known to produce the article of Tin in any quantities—the Straits of Malacca, the Islands of Banca and Billiton, and Great Britain; and in the latter country the production of tin is only known in the most western parts of the Empire—the counties of Devonshire and Cornwall; the latter county has been pre-eminent for the yield of this article for several centuries, and from the deepest explorations during the last few years evidence is now established of the inexhaustible productiveness of the Cornish tin mines.

Inefficient machinery during the early part of the present century, coupled with the low price of tin, caused a vast number of mines to be abandoned; but the tables are at last turned. Improvement after improvement has gone on rapidly progressing. Woolf—whose name ought to live in the history of Cornwall forever—made the most beneficial alterations and improvements in the steam-boiler, Trevithick and others on the invention of Watt on the steam-engine. Mines now in Cornwall, after having yielded millions sterling of copper ores, are under these masses of copper become equally rich in tin; but not so in the Islands of Banca and Billiton, where the tin exists only in beds or layers, in a decomposed granite formation, just as tin was found in the valleys in Cornwall by the ancient tin streamers. But lodes or veins do not appear to exist in the above islands, by all accounts written by English gentlemen sent out to survey these islands. No evidence has as yet been given of any copper having been discovered in these islands. Copper is only found in quantities in Cornwall and Devonshire in clay-slate, schists, or killas, near the granite formation, or in the granite hills adjoining the killas, and most productive when these basins are traversed by elvan channels or courses, more properly speaking porphyry.

What effect will the great massacre have on the price of tin just taken place amongst the Chinese population in the mines in the Laroot, in the Straits district, where the Chinese have quarrelled and murdered each other by hundreds, if not thousands?

Copper and tin in Cornwall and Devonshire appear to go hand in hand. No very great deposits are found in these counties far apart from each other either of copper or tin. A. BENNETT.

MINERAL HILL MINE.

SIR,—The telegram recently received from Mr. John Taylor, jun., as to this mine will no doubt excite considerable anxiety amongst the shareholders for the arrival of the promised written report.

I cannot believe in any collapse or in the entire exhaustion of the deposit of silver ore in this mine. Although the limestone is always uncertain, the ore being found in deposits, and not in veins or lodes, still some of the richest silver ore deposits in the world have been in the limestone strata.

The very interesting and highly important letter which appeared in the Journal of last Saturday on this subject, contributed by Mr. Henry Sewell, of Utah, gives most valuable information as to the mines of Charnacillo, in Chili, practically illustrating the fact that deposits of silver ore in the stratified limestone occurring near the surface generally repeat themselves at depth.

Why should not similar results follow at the Mineral Hill Mine? It is but of little use driving levels in such a stratification, but let the "leads" be sought for and followed.

The mines now called the "Eureka Consolidated," near Austin, in Nevada, were rejected by a London company about two years ago, in consequence of the agent sent out expressly to inspect reporting that the ore was a deposit in limestone, and therefore not worth consideration. These mines, it has been stated, have paid dividends somewhere about 20,000*l.* monthly, and the reserves of ore are now reported to be worth $20,000,000.

Other equally valuable properties in the limestone series might be named, but my object is simply to direct attention to facts but little known, and to express the conviction that if the Mineral Hill property be only thoroughly examined and tested, with efficient judgment and skill, the result will be highly satisfactory to the interests of the shareholders. PRACTICAL.

ENTHUSIASTIC MINING—WHO IS TO BLAME?

SIR,—To one situate like myself, so as not to be able to avoid seeing from an interior point of view, and without being myself interested only in that indirect way in which all mining men are affected by the good or ill success of mining, it has been exceedingly painful to me to witness the display which has been made, scenic and otherwise, and the effects that have resulted to foreign capitalists (principally English) from the selection that has been made of mines in this part of the country, and the way in which they have been subsequently handled.

That confusion is itself confounding has been sufficiently evidenced by the way in which mines, so called—the skeletons of their former selves alone remaining—have been selected and purchased at sums which actually stagger reason, and almost defy credence.

My chagrin has also been equal to the painfulness of the emotion I experienced in apprehending the consequences I so confidently anticipated, in that I flattered myself, and boasted, that the English could not by possibility be captivated by the spurts and excrescences of nature. I felt assured from the deepest recesses of personal conviction, based upon the extensive and varied experience of the English in mining, that the undefined confusion of metalliferous deposits, scattered here and there, without rhyme or reason, amidst disrupted masses of the most treacherous rocks known to the miner, could have but one effect on the mind of every prudent person, and that was to repel and not to attract; and it was a stereotyped conclusion in my own mind that the English were cautious to a fault. But I have practised deception upon myself in this respect, and am henceforth silent.

It is much to be feared that the effects of this overwrought enthusiasm will not end with the collapse of the bubbles which produced them, but that the failure to render tangible idealistic creations of the mind, and to animate the crude abortions of fancy, already exploded, will be transferred from the province of designing operators to the arena and credit of legitimate mining, and thus these transparent mockeries of man and things be regarded as representa[tive] of the wealth of the country, and themselves the examples of all [en]terprises in this field of investment. Such a result as this is as [mu]to be deprecated as the former is to be deplored, but one will [suc]the other as intimately and inevitably as cause and effect, if [not] timely and intelligently guarded against and resisted, and thus [an] additional injury be done to mining in general, and to this part [of] the country in particular, besides inflicting a twofold wrong on [in]vestors generally.

If I proceed to enquire the reason who will answer me? Why [is] it that undefinable and incomprehensible deposits have been cred[ited] with all the stability and constancy of yield due only to the best [as]sure veins and the most productive lodes known to mining? Why has reason been suspended, and the utterances of experience veto[ed] by an imperious fancy, when appealing to the judgment and un[der]standing? I have previously stated in at least one communica[tion] to the *Mining Journal* that the conduct of man has been as though there were two separate sets of laws in the mineral kingdom—one in this country and another in Europe, diametrically opposed to each other, and as though all the knowledge and experience acquired re[gu]lating to the latter had been entirely ignored as having no possible application to the former. No more than the waters of the mighty river are represented in volume, density, and power by the bubbles floating on its surface, begotten by the dropping of rain, is the [me]talliferous wealth of the Pacific States of America represented by the few sensational mines now agitating from centre to circumference the minds of so many capitalists in London.

The great metalliferous wealth of some at least of the Pacific States lie entombed in the close embrace of the water ruck, and not on the surface, much less on the laps of the erupted rocks, thousands of feet above the level of the beds in which they were first deposited and formed. Such occurrences as these disruptive agencies produce are valuable so far as they go, and would be of considerable benefit to the country if they had not been exaggerated—dignified with epithets belonging to another and widely different class of [ph]enomena and expanded into proportions by an imaginary process, wholly at variance with any known facts, and at the same time too crude to be submitted to the reason for recognition and endorsement, without giving offence to that right royal faculty of the mind.

Because the country was new it must have been thought that it was necessarily regulated by another class and code of natural laws than those of the old world, and that if causes are unique so might their effects be. I have more than once, in view of the impending crisis, attempted by an unpretending statement in the columns of the *Mining Journal* to guard against such a catastrophe and to correct such an erroneous conclusion regarding the laws which regulate the mineral kingdom—for conclusion it was, arrived at as a bound, without the light of experience to guide, or the necessary process of reasoning by which to determine such an assumption. But mild (though pointed) remonstrance or pertinent insinuation are alike unavailing to check the impetuosity of human actions when impelled by excitement. There is nothing to be done but to allow it to speed onwards in its eccentric course with accelerated velocity, due to an increasing momentum, resting in the assurance that the resistance of naturally opposing circumstances will in due time counteract any and all combinations of spurious forces, and restore the equilibrium. So that the more violent the action the sooner will be its termination, and consequently the end of the evil.

In conclusion, I ought to say that nothing but a resistless sense of duty could ever have incited me to this communication,—a duty devolving on every official as well as professional miner, to protect an industry so susceptible to abuse, and so easily demoralised, from abuses of every kind, because important personal and public interests are involved. And therefore it is a duty which I owe in common with others of my class. In the first place to mining itself, whose interests are my interests, because from earliest boyhood I have actively identified myself with its practical pursuits, and my fortunes with its vicissitudes.

In the second place, it is a duty I owe to the country in which I live, and by whose prosperity or otherwise I am unavoidably affected.

In the third place, it is a duty I owe to the country from whence I came, and perforce to my countrymen in general. And, lastly, it is a duty I owe to myself to relieve my mind of a responsibility which a sense of duty undischarged would inevitably inflict upon it. And because I know that a competent knowledge and a proper appreciation of the resources of this part of this country, especially of this State—I do not know so much about its sister States—would be a sufficient inducement to capitalists to invest in and to prosecute such legitimate enterprises in a business and miner like way, on a sound system of principles, and I venture to affirm that under such a regime no channels of investment outside of mining, in any part of the world, would be near so remunerative and satisfactory to investors as silver mining in this part of the country. ROBT. KNAPP.

Ellsworth, Nye County, Nevada.

THE MINES OF CORNWALL.

SIR,—After a period of gloom, caused by circumstances foreign to mining itself, brighter days have come upon us; and although the amount of capital lately invested in Cornish mines is small compared with other undertakings brought before the public (of which foreign mining has absorbed an immense portion), it is gratifying to us Cornish people to find the results so far most favourably compare with those of the best schemes of the day. There has not yet been any great number of mines set to work since the revival of trade, but in looking down the list of Dividend Mines in the *Mining Journal* I find the increase tenfold in this county compared with others, and there are many more which must shortly follow, looking at their present position. The mines lately put to work in West Cornwall promise to do well in most cases, and everything, in my opinion, goes to encourage mining at home in preference to foreign countries. Gold and silver are very tempting, but are of no value in the distance; and I have often wondered, as a practical miner, why gentlemen will risk their money in so many of the foreign schemes, where the amount for purchase is so high, without a sight of the property or a report thereon from an agent of their choice. As a rule, it costs more money to get up a company for a foreign mine, sending out inspectors, &c., than is required to properly work a mining property at home; besides this, our mining districts are within a day's journey, and every investor can come and see for himself, and what he does not know about mining he may get from experienced and trustworthy persons of his own choice, and with little cost. But still away goes the money after the glittering gold and silver mines, on a promise of 15, 18, or 20 per cent. interest for it, and the end, I fear, from a knowledge I have of many of them, will be fatal.

There are many good things at home within the investor's reach, if he will only give them attention, and make a careful selection; and the prospects of some of the mines just commenced should encourage it. Trelegh Wood, with a cost of only 3*l.* per share, are now over 200*l.* each. New Rosewarne, with 4*l.* paid, are now over 50*l.* West Rosewarne, Florence Tin, Florence United, and many others are opening up well, and likely to prove grand successes with a little further outlay, and in a very short time. The Old Wheal Busy Mine, which was abandoned some years since, has been taken up and started by some spirited local parties, believing that it will yet prove a successful tin mine, and their judgment thus far seems to be confirmed by results; we hear they have now come on a lode worth 100*l.* per fathom, although the mine has only been in operation just a few weeks. Several other abandoned mines are, I hear, about to be worked in the same district. I have often thought what can be the reason that the Penberthy Crofts run of mines, in the parish of St. Hilary, has not been taken up and worked by some spirited company. These mines have not been worked for nearly 60 years, and then under the greatest disadvantage. I believe the deepest point is only 110 fms., which was at that time drained by an old-fashioned steam-engine; there was no steam-power used for drawing the ores, &c., and notwithstanding there is abundant evidence of plenty of tin being raised, in addition to immense quantities of copper ore (being worked particularly for the latter), there was no steam-stamping machine on the mines, and the tin returned by that company, being only the very best of the stuff, had to be taken some distance from the mines, at great expense, to be dressed for the smelting-house. Thousands of

pounds worth of tin has been sold from the surface since the abandonment of the mines, which was left there as valueless, and operations have been going on here on the halvans and burrows almost all the time, and poor people making their living out of the refuse, which is the case to this day. Penberthy Crofts Mines are considered by the most practical and best mining men in the county to be a splendid mineral property, with the advantages of several large lodes, all proved to be productive for either tin or copper. The workings are not deep, and by erecting a good engine on Baronet's shaft large returns can at once be made, and during the draining of the mines the tin part of the main lode can be worked in the upper levels that was left by the old workers, and the copper only taken away. This tin ground is said to be rich by the old miners, but was not valued by them in that day. A great authority, and extensive mine manager, and one who has a knowledge of these mines, gives it as his opinion that Penberthy Crofts will yield, when set to work, 40 tons of tin and 300 tons of copper monthly. I should much like to see these mines at work, and hope some party will soon have spirit enough to take them up, for if there is any mineral ground in the county worthy of the outlay this is.

I, therefore, advise mining gentlemen, instead of spending their money for what they know not to keep more at home, and by working such properties as I have recommended they will receive a handsome return for their money. We have now a wonderful price for tin, which must come chiefly from Cornwall. Copper, too, is now bringing a very remunerative price. In no country is labour and materials so cheap as in this county, and looking at all the circumstances and advantages I would again say, *support mining at home;* and this, judiciously done in *bona fide* undertakings, will, I do not hesitate to say, pay the investor better than anything else I can recommend.

April 23. A HOME AND FOREIGN MINER.

"WHAT TO SELECT—WHAT TO AVOID"—No. XVIII.

SIR,—During my recent tour in Cornwall, I visited many of the leading mines at present before the public; and, judging by the only standard upon which their value can be computed with any approximation to commercial certainty, it is perfectly clear that in the present somewhat excited condition of the market there are really many sound *bona fide* mines either totally neglected or selling at a price far below their actual worth; while, on the other hand, there are, probably, more commanding prices wholly unwarranted by existing or prospective conditions.

Numberless mines have been, and about to be, re-started that after protracted struggling succumbed a few years since to the then ruinously low value of metals—mines, with tin and copper at anything like the present value cannot fail, with proper management, to prove great successes; but the danger of a period like the present causes the inevitable introduction of meritless schemes—projects without one redeeming point in their favour—fanned into puny life for the especial and exclusive behoof of hungry vendors. The uneducated and inexperienced investor necessarily finds a hopeless difficulty to winnow the chaff from the grain, to select the wheat and avoid the tares.

During my mining tour, although extending over only a short time, both classes of properties came under my personal observation; but, taking all circumstances into consideration, it is not too much to say that, certainly at least during my experience, the mining interest of Cornwall has never been in such a generally healthy condition, nor has a period hitherto been known offering so many opportunities for the profitable employment of capital. Modern mining has never known tin to be anything approaching its present value; and, if statistics can be depended upon as a guide, the price must still further advance, and copper, notwithstanding the slight reaction which has just taken place, consequent upon over speculation, must, for various reasons, continue to command a highly remunerative value to the miner. Therefore delay in effecting purchases into really sound mines can only result in advantage to the existing holders of such stock. All that is required in the present time is a judicious care in the selection to ensure handsome profits.

WHEAL BULLER.—The prospects of this mine are of the most favourable character. From information I obtained from the best sources leads to the conclusion that no further calls will be required. The copper part of the sett presents the most favourable indications of an enormous deposit being near at hand. This part of Buller originally formed a portion of Copper Hill Mine, which was always remarkable for the exceptional richness of its produce—a most important feature in the present high price of copper. Buller is no doubt destined to become one of the leading mines in this most important district.

NORTH TRELEIGH WOOD.—This mine, as indicated by its title, is situated north of Treleigh Wood Mine. It is a parallel lode, which has produced samples of tin, broken near surface, yielding the high average of 25 per cent. This company is introduced upon that salutary principle which I have always advocated—the application of *all* the subscribed capital to the development of the mine, the vendors evincing their confidence in its success by accepting the whole of the purchase-money in paid-up shares. North Treleigh Wood, according to the best information obtainable, will shortly successfully vie with its fashionable neighbours. To meet the expressed wishes of several who desire to become interested in a mine in this immediate locality, but who object to take a share in a cost-book company, it has been decided to register North Treleigh Wood with limited liability, with its shares fully paid, and provided with a capital amply sufficient to fully develope its resources, and it is believed ensure a great success.

NEW WHEAL LOVELL.—Although unfortunate enough not to meet Captain Prisk, the manager, I was accompanied by Mr. Borlase, than whom few men know more of tin mines, and who is closely watching the various important mines in this district. I found all I have already stated respecting the successful future of this mine more than borne out in every way. Kendall's shaft is opening out a rich course of tin, improving in richness in depth. The lode in the 15 end east is worth 15*l.* per fathom, and improving. Whilst on the mine I saw some exceedingly rich grey ore raised from the 50, under the slide, impregnated with tin, which in my opinion strongly indicates a very favourable change in the character of the tin lode. The same thing occurred, I believe, in Trumpet Consols, and also in East Lovell, previous to the meeting with their large deposit of tin. The machinery is ample to work the mine for some time to come. The present price of shares, representing a little over 12,000*l.* for the mine, is very far below their intrinsic value, especially when compared with many mines now before the public.

PERRAN WHEAL VYVYAN.—I find that operations have been fairly commenced upon the new lode; and, although only so recently discovered, a shaft is in full course of sinking. The opinions of those connected with the property, and the neighbouring mines, is that upon development further important discoveries will amply reward the shareholders. This lode, which certainly presents the most promising prospects, is described by those best competent to judge as altogether unequalled by anything seen in the district at a corresponding depth. Upon the whole, it would be difficult to find a young progressive mine possessing such elements of success.

Pinner's Hall, Old Broad-street. FREDK. WM. MANSELL.

MINING IN THE ST. AGNES DISTRICT.

SIR,—St. Agnes has long been known as one of the good tin districts. Several mines in the parish have yielded large profits—Wheal Kitty, Trevaunance, Polberrow Consols, Wheal Towan, Wheal Charlotte, &c. At present the prospects are good in several of those at work, and particularly at a mine long idle, but recently resumed by Mr. Joel Phillips, of Blackwater, who made money in America. It was called Wheal Concord, but now Briton Mine. There are numerous lodes in the sett identical with those in North Treskerby; on one of these lodes in particular the present operations are conducted, and it is said that it is worth 500*l.* per fm. It is certainly very rich, and Mr. Phillips, who has 32-40ths of the whole mine, is sure, from present appearances, to realise a large fortune. The sett is large, embracing part of Scorrier Consols, East Treskerby, and Prince Coburg. At the eastern end of the Briton Mine lies Burra Burra Mine, which was taken up by Mr. T. Powning, of Truro, who has sold it to a London party. The works are commenced, and will be carried on, I hear, with spirit. A steam-engine has been purchased for pumping and stamping, eight or ten lodes have been cut, and each of them yields mineral of either tin, copper, lead, or blende. It is an important fact for the company that the rich tin lodes in the Briton Mine intersect this sett. The late company, who ceased to work about 10 years ago, did so because the managing agent held a large portion of the mine, and could not afford to carry on his shares. He, therefore, advised abandonment, and that at a time when the prospects were good and improving. The mine is only 36 fms. deep. At North Treskerby the men are busy about the engine-house for the large engine to be erected there. This sett is now extensive and valuable.

April 25. R. S.

MINING IN IRELAND—THE GLANDORE MINE.

SIR,—The writer who signs himself "Your Correspondent," in the Supplement to last week's *Mining Journal*, says truly "false statements will never make a good mine." No more will false statements and the suppresion of facts add to the reputation of an anonymous writer. Mr. Thomas Tonkin's letter in the *Mining Journal* of the 13th inst., as the resident agent at the Glandore Mine, speaks of facts existing at the present time from his own personal knowledge of them. It is well known that when the late Mr. Thomas Tonkin, a part owner of the mine, worked it some 30 years ago up to the time of his death, 5 or 6 years since, he only gathered the manganese lying at or just under the surface; and it being so mixed with the iron ore, and no dressing machinery on the mine to separate them sufficiently, caused the Glandore manganese to be characterised as irony. But all he ever sent to market was sold, though at a reduced price. I will venture to assert, from my own personal knowledge of the mine, and parties connected with it for over 20 years, that "Your Correspondent" cannot prove one single instance of the manganese sent to market and not being sold.

The copper lodes in the Glandore Mines were never opened upon; and it is doubtful if they were known to the late Mr. Thomas Tonkin. For it is only within about 2½ years they were discovered, and the rich copper ores the present agent describes were first seen or known to exist in such quantities as are now met with. It is to be regretted "Your Correspondent" did not visit the mine before he published anything throwing doubts upon the resident agent's veracity; if he had, he never would have made the erroneous statements he has in saying the beds of manganese are exhausted, nor that iron ore cannot be found in large paying quantities.

A LOVER OF TRUTH.

MINING IN IRELAND—THE GLANDORE MINES.

SIR,—I perceive the writer of the sophistical paragraph respecting the Glandore Mines in the Journal of April 6, has again come forward under the mask of "your Correspondent," in last week's Supplement of the *Mining Journal*, to reiterate statements I feel in duty bound to entirely refute. The great vertical channel of copper iron and magnesia on which these mines are situated runs about 35° south of east and north of west, and extends from Leap to the east of Rowry Glen, a distance of 2 miles, and for 1¼ mile through the Glandore Mine sett, where it intersects several east and west quartz and copper ore lodes, and is from 5 to 15 fathoms wide in many places.

The champion copper ore lode runs parallel with the manganese and iron formation, and occupies the south part of the great channel. It is considerably improved at the points of junction with the east and west quartz and copper ore lodes, and its appearance at the greatest depth yet reached (15 fms. from surface) is very cheering, the productive portion being 2 ft. wide, and for 6 fms. driven on its course rich in cuprite black oxide and native copper. Explorations have also been carried on for some distance along the backs, and with the most favourable results, the lode even at surface being strongly impregnated with copper ore.

Since the discovery of this lode about two years ago, three parcels of copper ore of such purity as to need no dressing, were raised, shipped, and consigned to Messrs. J. Berger Spence and Co., of London, Manchester, and Glasgow. Operations were also recently carried on in the old manganes excavations, and from a mere continuation of these workings in about 12 months close on 600 tons of manganese ore was raised and sent to market. There is no deterioration in the quality of the manganese, and in the bottom of our deepest workings a course of manganese and iron, 35 fms. long, and from 8 ft. to 12 ft. wide, is now laid open. These facts, I think, will speak for themselves; and, as I before mentioned, our copper, iron, and manganese channel extends the full length of the sett, a distance of about 1300 fms.; of this only 100 fms. long, and the very limited depth of 16 fms., have ever been operated on. Consequently we have 1200 fathoms of ore-bearing country still intact; yet "your Correspondent" gives vent to statements the most eccentric visionary would not be guilty of. Messrs. Tonkin and Co., the late proprietors, obtained for many years large quantities of manganese ore from the excavations now known as the manganese workings; and their operations were not discontinued through a falling off in the quantity or quality of the ore, but were suspended because of the dulness occasioned in that branch of industry by the protracted civil war in America.

I agree with "your Correspondent" that false statements will never make a good mine, yet they answer the purpose he is seeking to effect remarkably well.

April 23. THOMAS TONKIN.
Superintendent of the Mines.

THE GREAT LAXEY v. THE OFFICE OF WOODS AND FORESTS.

SIR,—I beg to give you a few plain facts as my opinion in reference to this matter. It is quite time the mining public should look to their interest in the direction of the Office of Woods, &c., at the head of which is the Hon. J. K. Howard, and I believe his father before him held this (I presume) comfortable office. A very large portion of the land in Wales belongs to this so-called "Woods and Forests," which is not Crown land, but belonging to Government—or, more properly speaking, to the people. Now, how are these mineral rights managed? Why, instead of encouraging speculation in mining, it would appear that everything is done to discourage persons wishing to invest their money in this way. I will give you a comparison between the mananagement of the Woods and Forests and a private landowner. Most lead mines and slate quarries are first started by working miners, who, having spare time, dig and peck about, looking for mineral veins; when a vein is found several of the miners join and apply to the Office of Woods and Forests for a "tack-note." After waiting a reply for some time they get one, with a request that 5*l.* be sent before the application can be considered. This is often very discouraging to these poor miners, as 5*l.* to them would be as hard to find as the vein itself. But this is not all; after waiting two months a tack-note is perhaps granted them for twelve months, which, by-the-bye, is generally dated from the date of the first application, at 1-12th dues, at the end of which time, should you require the tack-note renewed, you must this time send 7*l.*, and have to wait a considerable time before you get it. Of course, working miners cannot carry on operations without capital, therefore their object is to find the vein of ore and then sell their interest in the tack-note to someone who would form a company to work the mine; but the great drawback is that the Woods and Forests will not grant a transfer of the tack-note unless one-fourth part of the purchase-money (after deducting the cost) is paid to them. This demand has only been in force about five years, and I consider is acting very injuriously to the revenue of Woods and Forests.

I will not state the manner in which a private landowner in Wales grants a tack-note—Sir Watkin Wynn, for instance. If you apply to his agents they will grant a tack-note for three years at 1-16th dues, their charge for which is only three guineas. Now, this is reasonable, and gives ample time for the holder to make some discovery on the land. Of course, a large number of these tack-notes are failures, but supposing a person does find a good vein, and has it for disposal, the first question asked is—Is it Crown land? If so, a large majority of speculators will not touch it, knowing from experience the difficulties they have to contend with, the Crown agents discouraging the opening instead of doing their best to encourage it, not only for the sake of employing the people, but also to keep the country in the present prosperous condition. What should we be as a nation without our mines?

My opinion of the mineral rights now under the management of the Woods and Forests is that they should be in private hands, then the produce of minerals would soon be doubled. From this circumstance the surface land (in the majority of instances) belongs to private owners, and the minerals to the Woods and Forests; and it is well known in Wales that the owners of the surface, if they find a lode of minerals, cover them so that the land shall not be damaged. Now, if the minerals belonged to the owners of the surface the mines would soon be opened.

I would suggest that all parties interested in mining (and more especially those in the Great Laxey Mine) should at once move in the matter, and protest against the Woods and Forests taking part of their profit, as they propose doing with the Great Laxey, as, now that their lease is up, they will not grant a new one without they participate in the profits. I venture to say that if the mineral rights now under the control of the Woods and Forests were sold by auction the Government would realise such an amount by these means that, if invested in Government securities, would bring in three times the sum now paid into the Exchequer through this source.

AN OLD MINER.

WHEAL BULLER MINING COMPANY.

SIR,—After a careful perusal of the account of the Wheal Buller meeting, published in last week's Journal, I feel bound, in justice to all who are interested in Cornish mining, and have a desire to see it worked in a "fair and open" manner, not to let it pass without some comment.

Some short time ago the management was removed from London to Cornwall on the express understanding that the expenses were to be curtailed—this being the reason given for the change—which it was confidently anticipated would be accomplished. After a trial of some months, however, it has resulted in a failure, for I see by the report that the excess of liabilities over assets is 964*l.* 6s.3d., to which must be added the cost for March and 17 days in April, amounting to about 700*l.*, thereby leaving a balance against the adventurers of 1664*l.* 6s. 3d., which is considerably more than at the last meeting. The call of 2*l.* per share pays only a portion of this balance, leaving a debt against the mine of 644*l.* 6s. 3d., with nothing to carry on for the next four months. It may also be well to mention that credit is taken for the ore sold up to the day of the meeting, whilst the cost is only charged to the end of February.

If your readers will refer to the agent's report, and compare it with the one published some six or eight months ago, they will find that the lode at Hocking's shaft, the most important point in the mine, has fallen off from 80*l.* to 20*l.* per fathom. How does Capt. Iuch reconcile this with his statement at the meeting that "the mine was at the present time looking better than it had for the past seven years," although he "did not like to say there would not be any more calls?" How unanimous the meeting seemed in its approval of all propositions emanating from the Chairman (who, I am told, is secretary, purser, &c., of the mine). Without a dissentient voice, it resolved to increase that gentleman's salary, and appoint an extra agent. This must be most reassuring to those shareholders who looked for economy from the new management; and those gentlemen who were represented by Mr. F. W. Mansell have good cause to congratulate themselves on the way in which their trust was fulfilled, for the very important enquiries respecting the working of the mine which he made at the meeting are apparent to all who have read the report.

SENEX.

TIN DRESSING.

SIR,—I am surprised that Capt. Sprague, the great man, should so condescend as to take any notice whatever of the letter on tin dressing by "Tin Dresser."

It appears from the Captain's letter he is going on unto perfection. In the first place, he tells us he began 35 years ago as stamps boy; secondly, that he had been a working man, which no one disputes—it is the very thing I said in my letter, and gave it as a reason why he was not a competent judge upon the question he was writing on; thirdly, that he had been an under agent; and fourthly, but not least, that he had been a manager. It is really wonderful! But if ever he has been a manager of any mines it must certainly have been out of this kingdom. I have known the gentleman for years, but never understood he was ever offered a managing agency anywhere throughout Great Britain. But suppose he was once appointed as manager of some small concern, that does not say he is qualified to give an opinion on every subject. His letter seems to be more the work of a stamps boy than the production of a man fit to set the tin-dressing branch of Cornish industry on a sound and scientific basis.

Any man who can make up his mind, and say that no improvements in tin-dressing have taken place in Cornwall during the last 50 years, must be woefully ignorant, or is not so careful over what he asserts as he ought to be. I need not go back so far as 50 years to prove the fallacy of the above statement. Take the quarterly reports issued by the different mines of this county 20 years ago, and you will find it would cost them about 12*l.* or 15*l.* per ton to dress their tin; now it can be dressed in the leading mines of the county at from 3*l.* to 4*l.* per ton, and then effect a saving of 30 per cent. of the tin which used to escape with the waste when the captain was a stamps boy, or more recently, say 20 years ago. The tin could not be dressed so carefully during that time as now, owing to the inefficient machinery brought to bear and their method of dressing. Look at the tin dressing plants of to-day in this county and those of 20 years ago, and I dare any man to prove there are no improvements in the principle of tin dressing.

I think, Sir, Mr. Pitt's opinion of Lord Thurlow, when Lord Chancellor, very nearly resembles Capt. Sprague's: that great statesman denounced the Lord Chancellor as a growler at everything, a proposer of nothing, and a supporter of everything.—*April* 23. TIN DRESSER.

PAWTON IRON MINES, WADEBRIDGE.

SIR,—Lord Torrington, and other gentlemen from Penearrow, visited these mines last week; Lady Molesworth, lady of the land, suffering from a cold at the time, was prevented joining the party. Capt. Rosewarne, the manager at the mine, showed them all the surface operations that had been done by the present company since they had commenced operations. Building of engine-house for 66-in. cylinder engine; boiler-house for boilers, &c. When leaving they expressed themselves very much pleased with what had been shown them by the manager; and his lordship, on behalf of Lady Molesworth, gave all the men on the mine a handsome amount. Give honour were honour is due; these mines would not have started so soon, or, indeed, might not have started at all, had it not been for the indefatigable exertions of Mr. Wm. Paynter, jun., to whom the town and neighbourhood of Wadebridge are so much indebted for having put that letter in the *Mining Journal* on July 22, 1871, when he had so many communications from different parties about the mines, and was the cause of its being ultimately started. Our friend's heart and soul is in mining, and he is always happy whenever anyone comes to Wadebridge to give them every information, and show the mines in the neighbourhood.

Wadebridge, April 22. A WELL-WISHER TO MINING.

WHEAL PEEVOR, AND TRELEIGH WOOD.

SIR,—Mr. C. Bawden, dating from St. Day, in Cornwall, informed your readers on Saturday last that Wheal Peevor "adjoins and is on the same lode as Treleigh Wood." It is much to be regretted that such a statement should have been published. Wheal Peevor is known to be a good speculation, standing on its own merits, but it is half-a-mile at least to the north of Treleigh Wood, and *not* on the same lode, as your correspondent could easily have learned if he did not know it. TRUTH.

FURZE HILL TIN MINING COMPANY.

SIR,—My attention has been called to a letter in the Supplement to last week's Journal, signed "A Shareholder of Recent Date." I beg to say no notice can be taken of such anonymous correspondence, the object of which is apparent—to depreciate the value of the shares in this undertaking. Every shareholder can obtain any information concerning the mine by applying to me, and enquiry is courted, as this valuable property will bear strict investigation.

Tavistock, April 24. THOS. HORSWILL, Secretary.

"CIRCULAR MINING"—GLAIN PEDROR MINE.

SIR,—I write to ask, through the Journal, some well-informed correspondent whether Glain Pedror Mine is a good investment, and what is the market price?

I have received from time to time sundry circulars offering these shares at prices from 30*l.* to 44*l.* First, early in March I receive a circular from Messrs. J. Bell and Co., of Bush-lane, offering 20 shares fully paid (30*l.*) at 33*l.*, if applied for before March 13. Following day comes a circular from Messrs. Brewis and Co., of Bishopsgate-street Within, offering a few shares at 38*l.*, if applied for before March 15. Same day comes a circular from Messrs. Howard, McEwen, and Co., of Fenchurch-street, offering shares in this mine at 34*l.*, if applied for before March 16. Two or three days after, I receive a prospectus from the office of the company, with a form to apply for shares in this mine at par.

I was permitted to rest in peace about a fortnight, when towards the end of last month another circular comes from J. Bell and Co., offering shares in this Glain Pedror Mine at 36*l.*, if applied for before April 5. Then a day after comes one from Howard, McEwen, and Co., offering shares at 37*l.* 10s., application must be made before April 6. Then Brewis and Co. come up again; they ask 44*l.* now, giving April 8 for application. I am now left quiet for another week, but at the end of that time Howard, McEwen, and Co. write me again, offering 23 shares at 40*l.* 12s. 6d., to be applied for by April 17. On April 18 comes a copy of a telegram from the secretary of the company. Why he should send me a copy of the telegram, not being a shareholder, I do not know.

I hope they have done with me now. I send you the Circulars. Each one you will see gives a glowing account of this mine—how the shares must reach 200*l.* and 300*l.* in a very short time. It is easy to see how the poor unwary sometimes get let in, for there is no doubt they do get let in, or it would not pay the parties to send these Circulars. I was circularised much the same way with a mine called "Terras."

You have commenced to expose the Circular nuisance, and I trust you will continue to do so. I really think someone should take the matter up, as it must tend to bring mining into bad repute. I will give 1*l.* towards putting a stop to it.—*April* 22. A VICTIM TO THE CIRCULAR NUISANCE.

"CIRCULAR MINING"—THE TERRAS MINE.

SIR,—You have so ably shown up the Circular nuisance that I beg to give you a little of my experience. I am inundated with circulars, sometimes five and six by one post. The mine I find generally selected by the gentlemen who so kindly send me these "nuisances" is the "Terras." This mine is very strongly recommended, at prices ranging from 3*l.* 10s. to 4*l.* 15s. The last circular I had gave a list of present prices extracted from the *Mining Journal* and other papers, and quoted Terras at 4*l.* 10s. to 5*l.*; but stated they had a few to offer at 4*l.* 10s. Now, I suppose these gentry presume that the people they send their circulars to never see your valuable paper. They have only to turn to that to see various offers, from 30s. to 40s. I noticed in the *Mining Journal* of April 6, an advertisement from Mr. J. A. Redhead, of Lincoln's Inn-fields, who I find is a highly respectable solicitor, asking for offers for Terras shares. To find out the real value of these shares that were offered me the same morning by one of these advertising gentlemen at 4*l.* 10s. I offered to take them from Mr. Redhead at 20s. each. That gentlemen very promptly replied that my bid was too low, but that he would sell me 141 shares, all he had left, at 25s. 6d. Now does not this look very much like a conspiracy among these circular men? I can well understand unsuspecting people being duped. They receive these circulars recommending this mine at prices from 3*l.* 10s. to 4*l.* 15s., all giving a glowing description of its prospects, and they consequently think they are doing a clever thing to secure shares from the lowest seller. But when they want to sell I fancy they then find out what the real market price is. I need make no apology for troubling you with this. You will confer a great benefit if you can put a stop to this "circular conspiracy," as it is in this way that mining is brought into disrepute.—*London, April* 23. CHAS J. ROYLE.

TERRAS MINE.

SIR,—In reference to Messrs. Marlborough's letter in last week's Journal, I have simply to declare that I have never sold them a share, nor received any money from them in connection with the above company. In negociating for a loan a transfer, not in favour of Messrs. Marlborough, was granted as security, on the distinct understanding that it was to be kept for six months; this contract has attempted to be broken through, and as the money advanced has been tendered back, I consider the whole transaction closed. J. ADDISON.

Ormiston, April 24.

TERRAS MINE, AND THE BROKERS.

SIR,—In last week's Journal Messrs. Marlborough again came to the front with a complaint, not against the intrinsic value of this mine, but, as usual, against Mr. Addison; then against the secretary of the mine, because he refuses to transfer shares out of the name of Mr. Addison, who has none, apparently, to transfer, and threatens such awful damages against the mine—"as advised by his solicitor"—that the *mine* or company must suffer dreadfully; and so I, who have bought shares from him, "will do well to await the result of this action, which is likely to affect his large interest." I don't see why I ought to wait, because, if he succeeds, what benefit can I have by waiting? Will he cancel his contracts with me if the price falls below what I contracted to pay him? I suspect not.

But as to his quarrel with Mr. Addison the public have no concern, and if an irregularity has been committed by the secretary, which I doubt, the company may be responsible in the first place, but the secretary is really the party responsible, and he is in circumstances quite able, and I make no doubt willing, to keep his employers safe. But I believe that Mr. Addison will deny, in your Journal, that he ever executed a transfer of Terras shares in favour of Messrs. Marlborough, or that they ever paid him hard cash for shares in Terras Mine—but let them fight it out. Now, what are Messrs. Marlborough's motives for all these attempts to depreciate Terras as they have done for months? I may not be entitled to impute motives, but I am entitled to state facts,

On December 12, 1871, Messrs. Marlborough contracted to sell to me Terras shares, deliverable at end of March, 100 shares; on March 18, for *cash* (not calls, as misprinted formerly), 20 shares; on March 22, for cash, 20 shares—140 shares. I sent cash to London to meet delivery of the first 20 shares, but to this day no transfer has been offered; but, on the contrary, I am told through the Journal that "I will do well to await the result of their action." What possible benefit I can derive by waiting for the result of an action that may endure for years, if ever raised, is beyond my understanding. I would not have noticed this letter but that its object seems to be to terrify timid shareholders into selling, and so sacrificing their shares, as I think, in this most valuable property. I am given

to understand there will be some 10 tons of ore for sale on the 10th proximo, all obtained from the halvans, and the quantity in future will be immensely increased when they obtain ore from the lodes at a value of 100*l.* per cubic fathom, instead of 5*l.* to 7*l.* from the halvans.

The shares are eagerly sought for on the Edinburgh Exchange, and cannot be had at 3*l.*; and by Christmas, or even August, they will be at a very different figure. I have been offering to take every share advertised by the London brokers, and those who have sold, besides Messrs. Marlborough, have had great difficulty in delivering. Even a small lot of five I cannot get. Timid shareholders will thus judge whether they ought to sell, and supply "bears" who depreciate their property. ONE THOUSAND SHARES.

VAN CONSOLS—ROSEWARNE AND OTHERS.

SIR,—As a shareholder in Van Consols Mine, allow me to enter a protest against the capital of that company being expended in law costs on account of any sharedealing transactions. It is difficult to conceive how anything Mr. Rosewarne may have either written or said can have injured Van Consols *as a property;* while, if he has interfered with the profits any shareholder might have made by dealing in the shares, that is a private affair, with which the company, as such, has nothing to do; and any law proceedings arising therefrom should be paid for by the individuals whose interests were affected, which are totally distinct from those of the company. INVESTOR.

OLD TREBURGETT MINING COMPANY.

SIR,—Illness having confined me to bed for the past fortnight, I have been prevented answering Mr. Wilson's letter in the *Mining Journal* of April 6. Had he confined his remarks to a straightforward answer to Mr. Bignell's letter in your previous issue, and not thrown out unfounded insinuations respecting myself, no further letter from me would have been necessary; but, as he has thought proper to do otherwise, it is incumbent upon me to answer him. I have, therefore, to again crave your space. In the first place, Mr. Wilson states that no mortgage of the property of the company was ever prepared or executed, and that he lent the company 750*l.* without any security whatever. I do not know how he can reconcile this statement with facts. It may be true that no *deed* was ever actually prepared, but I have before me the draft resolution in the Chairman's own writing, which states that in consideration of Mr. Wilson advancing 750*l.* a legal lien be given Mr. F. R. Wilson upon the engines and plant at the mine. This resolution is entered on the company's minute-book, confirmed and signed at the succeeding meeting; and I would like to ask Mr. Wilson, had the money not been forthcoming to pay him, would he then have considered that he had not a legal lien or mortgage of the company's property? I fancy he would, and if it is to be considered as such in one case it must be equally so in the other. It appears to me something like an agreement for a lease, which is just as binding, although sometimes no lease is ever asked for. As to the amount being repaid, this I stated in my former letter was the case.

With regard to my remarks upon the issue of a balance-sheet with incorrect share-books, I reiterate the same, and I also most positively assert that the books as written up in my office were correct, and Mr. Wilson will be good enough to remember that no balance-sheet was pretended to be issued upon the books as I gave them over, the same not being close up; but at the time to which I referred a balance-sheet had been printed and circulated, and yet the share-books incorrect. The remaining remarks of Mr. Wilson are almost beneath my notice, and I will only, therefore, state that I am perfectly satisfied with my business, and find my time fully occupied, and need no advertisement.

In conclusion, let me say that if my time were taken up by a business of treble the proportions of the stupendous one which Mr. Wilson wishes your readers to believe he now carries on, I should still find time after business hours, in justice to the shareholders, to inform them of acts which I consider do not tend to promote their interests. Let me again repeat that I believe in the mine, if properly managed. THOS. H. TILLY.

Victoria-buildings, Queen Victoria-street, Mansion House, April 22.

OLD TREBURGETT MINE.

SIR,—In noticing your correspondent, "Shareholder," in the Supplement to last week's Journal, I would beg to remark that Mr. Tilly's report to him was perfectly correct to a certain extent—"plenty to be had for getting out;" but probably your correspondent forgets that it takes time and labour "to get it out." From November last—the date of Mr. Tilly's visit—to within the last month such a wet season has not been known within the remembrance of the oldest miner. Hence this mine has suffered, with others in this county, from similar causes. I am pleased to observe by the report of Capt. Hancock that he is enabled to resume sinking the engine-shaft, by which, when accomplished, we shall have a new mine, with plenty of ore to bring to surface.

With regard to the promises made in the prospectus, and which continue unfulfilled, who is answerable? On referring to the prospectus, I observe Prof. Forbes promised great results from the capels—Mr. Tilly, the then secretary, issued those to the public. Perhaps one or the other can inform "A Shareholder" if they were "true or false." W. PAYNTER, Jun.

Wadebridge, April 23.

ERGLODD AND PENPOMPREN MINES.

SIR,—The suspicious-looking craft "Misrepresentation," hoisting doubtful colours, was overtaken and ruthlessly run down by the leviathan of Fact and Truth, and it is amusing to witness the grotesque and helpless manner in which those who manned the former, thus plunged into the abyss of despair, flounder about in their consternation and distress, and endeavour to clutch at every little imaginary straw that may be floating past. Not content to employ human artifice to accomplish the end in view, the aid of the supernatural is invoked by conjuring from the realms of Pluto, or the pit of Acheron, a nameless and mystical spectre, cunningly introduced as a "Near Relative of the late Dr. Hobson."

Angels and ministers of grace defend us! This ghostly illusion, this "goblin damn'd," sufficiently discloses the source it emanates from, the temperature of the regions it inhabits, and its present purpose here on earth, by the manner in which it belches forth its inconsistent twaddle about large profits being made, but nullified by mismanagement and spent in unnecessary expenses. Let me tell thee, O ghost, phantom, sprite, vampire, whate'er thou art, that a profit means money made clear of all expenses, it means pecuniary gain; therefore as there was no such gain derived, but a loss of over 8000*l.*, the mines must have been profitless, which is what I stated—15,000*l.* having been spent to raise 6650*l.* worth of ore. Why, if the ore sold had been raised for nothing the profits on it would not have been so very *large* on a seven years working.

Now, as to mismanagement. I will quote what a real fleshly and breathing relative of the late Dr. Hobson (not a mere shadowy myth) wrote a short time ago, "He (Mr. Gledhill) gave the Doctor every satisfaction in his management, in which he showed great ability and practical knowledge." The gentleman who penned this was and is interested in mining, and was, I believe, the only relative Dr. Hobson had who was at all acquainted with these mines.

Having consigned the sulphurous apparition to its unenviable abode across the Stygian creek, I will give the following (asked for) facts for Mr. Schmidt's more tangible digestion. It required more than 1500 fathoms of vein to be removed by tutwork (there was very little tribute) in sinking, driving, and stoping to raise in seven years the 475 tons of ore sold, and worth about 6650*l.* Besides this actual work upon the vein there were shafts, cross-cuts, pitwork, winding, dressing, and surface expenses, rents, royalties, machinery, tools, wear and tear, management, haulage, &c., to be added. If the promoters of this company can, from the "immense" average yield of 6¼ cwts. per fathom (say, 4*l.* 8*s.*), costing in its mere underground excavation alone from 3*l.* to 14*l.* per fathom, raise as much ore, make as many trials, and come out with no greater loss than 8000*l.*, they will deserve that credit for good management which it is at present convenient to deny to me. When Mr. Schmidt takes intending investors to the mine I would suggest a diving apparatus to enable the latter to visit the workings in the three engine-shafts standing under water before "parting;" and I would also respectfully recommend a microscope to assist him and them in seeing the ore to be at once sent to market (after machinery is fixed) at the rate of from 25 to 30 tons per month, and the character of the veins which are to return "from 30 to 100 tons per month," yielding "a clear annual profit of not less than 7,500*l.*" (*vide* Mr. Schmidt's report in the prospectus). Mr. Schmidt thinks my first letter uncalled for; had the property been faithfully represented on its merits I should not have interfered. The promoters of the company are interested in obtaining 15,000*l.* for these mines; Mr. J. M. Davies, the lessor, is interested in securing his royalties, &c., whether the mines pay or not. I have no motive in writing excepting in the interests of truth.

Before concluding my letter I will supply the following figures, obtained from the account-books of the mines:—

Total sum lost by Dr. Hobson	£6006	10	4
Ditto, by E. Green	1961	9	4 = £7967 19 8
Of this sum there had been lost before I took charge of the mines..	5061	9	4
And the previous managers had only raised between them 174 tons 18 cwts. of lead, which sold for 2322*l.* 6*s.* 7*d.*, or 13*l.* 5*s.* 3*d.* per ton.	—	—	—
My proportion of the actual loss was	£2906	10	4

And during my management I raised 307 tons of lead, which sold for 5980*l.* 6*s.*, or 15*l.* 1*s.* 3*d.* per ton. from an average yield of about 6 cwts. per fathom.

I simply reply to the charge of mismanagement and "nullified profits"—"Look on this picture, and then on that." EDWARD GLEDHILL.

Mining Offices, Shrewsbury, April 23.

P.S.—The 475 tons, worth 6650*l.*, are the figures given in Mr. Schmidt's letter.

ERGLODD AND PENPOMPREN MINES.

A FEW FACTS FOR MR. GLEDHILL.

SIR,—This property is bounded on the north-east by Cardigan Bay Mining Company, lately wound-up (same vendors, or some of them, as in Erglodd and Penpompren)—mines sold for about 500*l.*; on the south-west by North Allt-y-Crib (same vendors, or nearly so)—mine in hands of mortgagee. Mr. Schmidt's 20 years experience of mines perhaps true, but rather an anomaly, seeing he is about 30 or 32 years of age. Is he a member of the Civil Engineers Institute? Will Mr. Davis, the landlord, say that Dr. Hobson ever made a *profit* of the mines? Will Messrs. Day permit an inspection by the Taylors? their report to be final and conclusive as to the controversy. All facts herein stated cannot be controverted. X.

THE PENPOMPREN AND ERGLODD MINES.

SIR,—As Mr. Edward Gledhill probably has had enough of this, I shall merely content myself by stating that I have no doubt his intention in writing about the reports of such men as Mr. Jebu Hitchins, Mr. Cottingham, and Mr. Schmidt, was in the hope of obtaining what he has already achieved—notoriety. Mr. Gledhill, however, would fain draw us all in to refer to the time when the Messrs. Taylor worked a small portion of the sett, but, as his object is clear, I shall refrain from touching on that subject. Nothing more true was ever written than the letter which appeared in your valuable Journal of April 20, and signed by "A Near Relation of the late Dr. Hobson."

As Mr. T. L. Cottingham has not had so much experience in Cardiganshire mines as I have, I will, for Mr. Cottingham, furnish Mr. Gledhill with 10 mines in this county (in order to enlighten that gentleman as to the yield of silver in Cardiganshire), each of which produces, not from stray or picked samples, but from the bulk, more than 25 ozs. to the ton of lead. Beginning at the southern extremity of the county, we first have—Llanfair, producing 86 ozs. of silver; Vach Du, 84 ozs.; Rhydtalog, 86 ozs.; Cwm Mawr, 32 ozs.; Glog Fach, 32 ozs.; Goginan, from 30 ozs. to 32 ozs.; Cwn Erfin, from 30 to 32 ozs.; East Darren, from 28 to 30 ozs.; Old Darren, 36 ozs.; South Darren, 36 ozs.; Pen-y-Cefn, 40 ozs. This list I might enlarge on, but as 10 have been asked for, and I have exceeded that number, I will only add to it the sample referred to by Mr. Cottingham, containing 50 ozs. of silver from the Penpompren Mine.

Such letters as Mr. Edward Gledhill's do not really merit reply, and had it not been for the high character and abilities of the gentlemen referred to in it, and in order that the county should not be misrepresented by unfair means, I should not have noticed it. ABSALOM FRANCIS.

Goginan, Aberystwith, April 22.

MINING IN BREAGE.

SIR,—Having my attention called to the several letters on this subject in your late numbers, I have been surprised to find that so many mines are likely to become profitable in Breage and the neighbouring parishes, and being intimately acquainted wth the mines of that district, I am at a loss to account for the mention of, *to me*, unknown properties, whilst those that are really improving their position and realising the advantages of the advanced price of their produce are scarcely, if at all, alluded to. I do not imagine that your correspondents are actuated by any than disinterested motives in bringing the names of those mines they mention so prominently forward, but I am of opinion that "S. R.," for instance, might as well have mentioned West Great Work, South Great Work, West Godolphin, Leeds and St. Aubyn, Wheal Osborne and Florence Mines, in which, perhaps, he is as much interested as in Pollards or Pulrose, and I have no doubt that, upon enquiry, if he is not already acquainted with those mines to which I allude, he will admit the justice of my naming them as properties likely to add much to the credit of Breage and its neighbourhood.

Florence Mine, according to the reports of the late manager of East Neptune, is already a great prize, and I regret that "An Original Shareholder," in his reply to "P. J.," did not give the actual value or percentage of tin in the 120 tons of ore which is dressed ready for the calciner. C.

April 25.

MOUNT DALBY (ISLE OF MAN) MINING COMPANY.

SIR,—I have just read in the *Mining Journal* the prospectus of the Mount Dalby (Isle of Man) Silver-Lead Mining Company (Limited), and whilst I have no wish to depreciate the property, I feel it my duty to state for the information of those unacquainted with the district that there is about 1½ mile intervening between Dalby sett and the celebrated Beckwith's, in the possession (although at present unworked) of an independent company. Nevertheless there may, and I trust will, be lead enough discovered to satisfy the most sanguine shareholder in either sett.—*Isle of Man, April* 20. MONA.

SOUTH WHEAL KITTY.

SIR,—I am pleased to find from last week's Journal that this valuable piece of mineral ground is about to be re-worked. It was taken up by an influential party in 1865, but the then price of tin did not justify a continuance of operations. The property not only adjoins Wheal Kitty (St. Agnes), of which Capt. William Teague, the eminently successful manager of Tincroft and Carn Brea, is the manager, but that gentleman, after a minute inspection, has consented to accept the management of South Kitty. This is one of the most significant features in the enterprise, for it is quite certain that Capt. Teague would not associate himself with any mine the success of which was not assured.

The report of Capt. Teague upon South Kitty, which appeared in last week's Journal, is one of the strongest reports I have ever known emanate from that authority, whose characteristic has always been excessive caution.

When Capt. Teague assumed the active management of Tincroft the shares were selling at less than 10*l.*, or 60,000*l.* for the mine—the price is now nearly 80*l.*, or 480,000*l.*; Carn Brea, previous to Capt. Teague's management, was selling at 20*l.*, or 20,000*l.* for the mine—the price is now 180*l.*, or 180,000*l.*; Wheal Kitty (St. Agnes) was selling at 6*l.*, or 6144*l.* for the mine—the present price is 17*l.*, or 17,400*l.*; South Kitty is now selling at 3*l.*, and what its future value will be I must leave others to conjecture.—*April* 23. OBSERVER.

WEST CHIVERTON MINE.

SIR,—I have now another cause of grievance against our executive. The last time I troubled you was with reference to the withholding of information in regard to the unminer-like manner in which the vitality of our property was being exhausted, when the returns were made to yield a dividend profit of 2*l.* per share per quarter—when, in point of fact, the mine was being worked too fast. My statements were then called into question even by the executive; but results subsequently proved their correctness, not the least being the circumstance that in the meantime the largest shareholders had quietly reduced their interest to to the lowest possible minimum consistent with appearance.

But what I have now to deal with is the present. I am told upon the best authority that at the bottom of our mine a total change has taken place, by which the lode has been positively unbottomed. Such a serious fact as this should certainly be made known to the shareholders, as thereby the life of the mine is determined, the only chance of extending its existence being in what may be discovered in the lateral excavations.

The gradual decline in the price of the shares ratifies this condition of things, it being perfectly evident that if the general body of shareholdere are unacquainted with this grave fact others are not so oblivious, and that they are turning their information to a profitable account. A SHAREHOLDER.

April 23.

THE FLAGSTAFF SILVER MINE.

SIR,—Can any of your numerous readers inform me why the 10*l.* fully paid-up shares of the above company should be quoted at 12*l.* 10*s.*, whilst the 10*l.* shares of the Tharsis Sulphur and Copper Company are being sold at 42*l.*—the Flagstaff at present paying 24 per cent. in monthly dividends, while the Tharsis Company are only paying 20 per cent. per annum, in addition to the 24 per cent. at present paid by the Flagstaff? It is confidently expected that by the month of August next the directors will be in a position to increase the dividend to 35*l.* or 40*l.* per cent., besides having a very considerable reserve. Emma shares are only paying 18 per cent., and the 20*l.* shares are being eagerly bought at 32*l.*, and at this price they yield a very large interest, and look quite like going to 40*l.*, or even higher. The capital of the Flagstaff is little more than one-fourth of that of the Emma; and there is every probability of one being as productive as the other. According to the estimate of Mr. Maxwell, who has recently visited the mine, the net annual profit will amount to something over 146,000*l.*, equal to a dividend of over 50 per cent. per annum. It would appear that these facts have been quite overlooked by the investing public, otherwise the price of the shares would have been 20*l.* or 25*l.* ere this; and I have no doubt but they will see 30*l.* very soon, seeing that they are likely to be quoted in the Official List of the Stock Exchange on an early day.—*April* 23. INVESTIGATOR.

[For remainder of Original Correspondence see to-day's Journal.]

COOK'S KITCHEN AND WEST FRANCES MINES MEETINGS.

PROPOSED SUBDIVISION OF COOK'S KITCHEN SETT.

A meeting of adventurers in Cook's Kitchen, presided over by one of the pursers, Mr. Walter Pike, was held on April 18. There were present Messrs. C. Bailey, A. Lanyon, J. Kendall, T. Woolcock, A. Hingston, J. C. Isaac, J. Thomas, and the principal shareholders, representing nearly two-thirds of the shares.

The reports submitted proved to be of a most satisfactory character. A dividend as large as the one declared last quarter was made, 1*l.* per share, nothwithstanding that during the quarter the pursers have paid off the month's labour that hitherto has stood over. Amongst the items of expenditure was—for labour, 4785*l.*, and merchants' bills 1257*l.* On the credit side there was a total credit to the adventurers of 7729*l.* The tin sold realised 9869*l.* After paying off all debts a balance of 1578*l.* was left, and this, added to an available balance from the last quarter of 881*l.*, left a total credit of 2460*l.* In referring to these figures the Chairman said they had redeemed their promise of bringing up a month's cost, so that this quarter there were four months' costs charged against three months' returns. Still they were enabled to give the same dividend as they did last quarter, 1*l.* per share, although to do so they had to encroach on their balance, to which, had it not been for the extra cost, they would have been enabled to have now added nearly 300*l.* The whole of their tin they had sold up.

Capt. JOSIAH THOMAS had the following report from the agents:—

The engine-shaft is sunk 3 fms. under the 294 fm. level; the lode is producing a little tin. The 294, east of the engine-shaft, is worth 25*l.* per fathom. The winze under the 282 fm. level, 4 fathoms before this end, is sunk nearly 12 fms., and is worth for 9 feet long 80*l.* per fathom. We expect to hole the 294 to this winze in about a month. The 282, east of engine-shaft, is producing a little tin. We have of late been driving north through the lode, and find it to be upwards of 15 feet wide, but have not yet reached the north wall. The 270, west of engine-shaft, is worth 25*l.* per fathom, and the lode is of a very promising nature for further improvement. The winze under the 246, 5 fathoms before this end, is sunk 3 fathoms, and is worth for 9 feet long 100*l.* per fathom. The east shaft, sinking under the 258, is worth for 9 feet long 20*l.* per fathom. We expect to hole this shaft to the 270 in less than a month. The 246, east of east shaft, is worth 20*l.* per fathom. The 246, west of the engine-shaft, is worth 40*l.* per fm. The winze under the 234, just behind this end, is sunk 7½ fathoms, and is worth for 9 feet long, 45*l.* per fathom. The 234, west of engine-shaft, has reached a little cross-course, on which we are now driving north to intersect the north part of the lode—Duckin's lode. The 246, west of cross-cut, is worth 35*l.* per fathom. We have now driven through a lode in this level for 18 fms. in length, worth on an average 30*l.* per fathom. We shall shortly commence to sink a winze below this level. The 270 cross-cut is about 15 fathoms short of this lode. We are also continuing the driving of the 190 fm. cross-cut towards this lode from the engine-shaft.—JOSIAH THOMAS, CHARLES THOMAS, F. GILBERT.

Mr. BAILEY moved the reception and adoption of the report, and the declaration of a dividend of 1*l.* This was seconded and carried unanimously.

The CHAIRMAN then said there was a subject of importance to which he wished to call their attention with a view to discussion thereon. A recent valuable discovery in East Pool and South Crofty had drawn attention to that lode which runs through the entire length of their set to the north. It was an entirely distinct lode which ran north, while their lodes ran south, and it had been thought it was not fair to the adventurers and to the lord that such a valuable piece of ground should any longer remain idle. It was once worked, but about 20 years ago it ceased, at that time everything being depressed, and it now became a serious question as to what was the best mode of working the piece of ground. One or two ways presented themselves, but he thought the best way for the mine would be to work it as a distinct undertaking. (Hear, hear.) Of course they could work it with Cook's Kitchen Mine, but as it was probable within 12 months a cost of from 8000*l.* to 10,000*l.* would be incurred in developing the proposed mine, that would mean a total cessation of dividends for the adventurers in Cook's Kitchen, whereas they could work it as a distinct set of adventurers, still having the same interest in the old mine. Of course they were aware this was a general meeting and not a special meeting, so no special business could be done, but the adventurers might instruct the pursers to call a special meeting to take the matter into consideration. The first step they must take must be in regard to the lord, for it would not be proper for them to take any action in the matter without first obtaining the consent of Mr. Basset, who had always acted towards them with the greatest consideration. (Hear, hear.) It was only due to him that he should be the first to be consulted. With that view Mr. Cartwright (Mr. Basset's steward) had kindly attended there that day to hear the pros and cons of the question, and the offer that had been given. Very likely that gentleman would give his views on the matter, with which he was prepared to recommend.

Capt. THOMAS said they could not work the new ground without it was a separate concern.

Mr. BAILEY stated that in one of levels, when they once worked the ground they had several good bunches of copper ore. It continued for a short time and then it went out. In his opinion it was most desirable that the ground should be opened. There appeared to be every encouragement to work it in the most vigorous manner. (Hear, hear.)

Mr. CARTWRIGHT then rose, and said he could not tell them what Mr. Basset's views would be upon the matter, for the simple reason that it had only now come under his (the speaker's) cognizance, and Mr. Basset knew nothing about it. If it could be shown that it would be to Mr. Basset's advantage, there was no doubt but what he would adopt it. (Hear, hear.) The only question was how it could be best carried out, and it appeared to him from what he had heard that it must be worked as a separate concern to be of advantage to Mr. Basset to them, and to him. He took it that a special meeting would be called, and he should be very pleased to hear the result. If he could in any way further the views of the adventurers, not forgetting the advantage to be derived by the master, he would do it; but Mr. Basset always wished to be consulted in these matters, and as he was not now in the county very likely several weeks would elapse before he could give them a definite reply.

Mr. BAILEY then moved "That it be an instruction of the purser's to call a special meeting for May 9 next, to take into consideration the expediency of dividing the present sett in such a manner as may be determined on, either by forming the existing shareholders into a new company to work the north part, or surrendering the sett, provided Mr. Basset's consent be obtained, and taking up two distinct leases to work as separate mines, and to act thereon as the meeting may deem expedient."

Mr. WOOLCOCK seconded this, and it was carried unanimously.

WEST WHEAL FRANCES MINE.

The majority of the adventurers then proceeded to the counting-house of the West Wheal Frances Mine, where a quarterly meeting of those connected with this concern was held. Mr. W. Pike again presided. The financial report showed a total credit of 4411*l.*, and after paying off all costs, including 3210*l.* for labour, and 1148*l.* merchants' bills, a balance of 21*l.* was left. No dividend was declared, the balance being carried forward to the next quarter's account.

The CHAIRMAN explained that the reason why their expenditure was so large was through their having, in accordance with the wish expressed at the last meeting, paid off, besides the ordinary three months' labour costs, the one month's labour, amounting to 800*l.*, which had so long been in arrear. The accounts were now as close as they could be. (Applause.)

The agents' report, which was unanimously accepted, stated—

The 132, east of Bailey's shaft, is worth 20*l.* per fathom for the part driving 6 feet wide, but more lode is standing both north and south of the level. The winze under the 120, west of Bailey's shaft, has just been holed to the rise over the 132 fathom level. Most of the lode is standing to the south of the 132 fm. level, which we shall shortly commence to cut through. The 120 fm. level, east of Bailey's shaft, is worth 25*l.* per fathom. The rise over this level is up 2 fms., and is worth for 9 feet long 30*l.* per fm. The winze under the 1 8, just over this, is sunk 3 fathom, and is worth for 9 feet long 25*l.* per fathom. The 120, west of Bailey's shaft, is worth 30*l.* per fathom. The 108, west of new shaft, is worth 15*l.* per fathom. The 95, west of new shaft, is producing a little tin. At the 40, west of Bailey's shaft, we are sinking a winze to communicate with some workings over the 60 fm. level; the lode is worth for 9 feet long 12*l.* per fathom. We are still driving north at the 85, west of new shaft on the cross-course, but have not met with the lode on the western side of it. We expect to cut the copper lode on which the 60 was driven in about 8 fms. further driving, and we also intend to continue this cross-cut further north to intersect other lodes that are in that part of the sett. During the first month of this quarter our operations were very much retarded by the exceedingly wet season, which caused the water so much to increase that the greater part of our tin ground was covered, and we could only raise a small quantity of tin in consequence. We are now raising about our usual quantities, and the mine is in good order of working.—JOSIAH THOMAS, CHARLES CRASE, HENRY RABLING.

Mr. BAILEY asked whether Capt. Thomas considered the mine in as good a condition as it was three months ago?

Capt. THOMAS replied that he believed it was. They had not cut through the 132 yet, but if they found it a good lode the mine would be as flourishing as it had been.

WHEAL OSBORNE.—A meeting of adventurers was held at the mine on Tuesday (Mr. W. P. Cardozo, the purser, in the chair), when general congratulation was expressed at the progress the mine was making, and the great amount of work done in the last four months. Twelve heads of stamps had been put up, and dressing-floors admirably laid out and constructed in the most substantial and workman-like manner. Two large slime-pits were full, and new buddles had been set to work upon them, and another large pit was in course of construction. The floors were well stocked with tin, notwithstanding that there had been a sale the previous day, and great praise was given to Captain Carkeek for the energetic and economical manner in which he had worked the mine up to the present time. The Chairman read the statement of accounts, from which it appeared that there was an adverse balance brought forward from October of 493*l.* The four months' cost for labour and merchant's bills up to the end of February amounted to 1786*l.*; lords' dues, 28*l.*: making a total adverse balance of 2307*l.* The credits were—For last call of 15*s.* per share, 719*l.*; and during this month there had been sold upwards of 5½ tons of tin, which realised 568*l.*, the average price being 90*l.* per ton, and the highest price per ton being 95*l.* 13*l.* 6*d.* This left a balance against the adventurers of 1081*l.*, and the Chairman suggested that to wipe off this a call of 1*l.* per share should be made. He believed that that would be the last call they would have to make, and that in three months hence they would find they were making sufficient returns to pay the costs. Ninety hands were employed at the mine. The accounts were passed, and a call of 1*l.* per share was made. It was resolved unanimously to increase the purser's salary to 7*l.* a month, Capt. Carkeek's to 10*l.*, and Capt. R. Rowe's to 8*l.*

WHEAL JANE.—At the meeting, on April 15, the accounts for the three months ending February showed a credit balance of 663*l.* 2*s.* 7*d.* A dividend of 512*l.* (1*l.* per share) was declared, and 151*l.* 2*s.* 7*d.* carried to credit of next account. Capt. Wm. Giles, Wm. Giles, jun., and Thos. Williams reported the West Wheal Jane Company, in course of formation, would have to pump the water which has troubled them all the winter, and that, therefore, additional pumping machinery will be unnecessary. The question of subdividing the shares into 1024ths was deferred until next meeting.

[For remainder of Meetings see to-day's Journal.]

TUNNELLING BY MACHINERY.—The disposition to introduce mechanical contrivances to aid the workman in the more laborious mining and engineering operations has for some time past manifested itself amongst miners and engineers, and the very general adoption of mining and tunnelling machinery seems only to await the decision of practical men as to the relative merits of the several drills at present before the profession. The completion of so great a work as the Mont Cenis Tunnel would probably never have been effected but for the assistance rendered by machine drills; and as the gigantic work is one in which the general public take the utmost interest, the lecture by Mr. J. L. King, F.G.S., on the subject which at present forms one of the prominent attractions at the Royal Polytechnic Institution, will be listened to with much pleasure. The scenery of the district through which the tunnel passes is proverbially amongst the finest in the world, and following out the old Polytechnic principle of combining pleasure with instruction, Mr. King has contrived to introduce views of some of the finest Alpine scenery without in any way diminishing the instructive character of the lecture. These views are thrown upon the screen from a series of exquisite untouched photographs, by Mr. England, and embrace as much as many would desire to know of the old Mont Cenis route, Mr. Fell's celebrated railway, and the tunnel itself. But the part of the lecture which will interest practical men even more than the views is his admirable description of the tunnelling machinery. The "perforateurs," which have assisted to secure the names of Sommeiller and Gratoni a permanent place in history, are carefully described and illustrated; and the diamond drill of Leschot, which has been so vastly improved by Capt. Beaumont, R.E., M.P., and Capt. Appleby, and which is at present being introduced by the Machine Tunnelling Company, of Westminster, is not only described, but the description is rendered particularly lucid by the exhibition of one of the crowns of diamonds and specimens of the work done. It seems certain that in connection with slate quarrying the diamond drill would prove invaluable, for the specimens of cores shown prove that the work is well and cleanly done, and that the drill hole is left in the best possible condition for the insertion of the charge of gunpowder or other explosive to be used. In a future lecture Mr. King proposes to describe some of the more important tunnelling and drilling machines which have been brought forward, and explain their advantages, and in the meantime practical men who pay the Institution a visit will have the opportunity of examining the diamond drill, and work done by it in order to judge of its merits.

EXPANSION-VALVE WITH SELF-ACTING VALVE MOTION.—In one arrangement of the invention of Mr. F. WINDHAUSEN, of Brunswick, the valve is connected to a tube passing through the valve-box, and containing a rod, the lower end of which reaches into the cylinder, the upper end being connected to a piston in the cylinder. This cylinder communicates by a passage having two entrances, one shut by a spherical valve, the other by a screw-worked cone, a nut on the piston-rod regulating the piston. The expansion-valve is contained in a short cylinder inside the valve-box, and two openings communicate the interior of the cylinder with the interior of the valve-box. In another arrangement a central rod passes through the valve, the lower end entering the cylinder, the top end coming in contact with a lever connected with the rod of the small piston. In some cases the small piston may be moved by a lever and weight.

CASTING PITS AND CRANES.—The invention of Mr. B. D. HEALEY, of Swansea, consists in constructing ladle cranes of a horizontal framing, swinging round a pivot or column at an intermediate point of its length, and carrying the ladle at the front end, which overhangs the casting pit, and a balance weight at the tail end, which is supported on rollers. Other supporting rollers are placed between the pivot and the ladle end, and are rotated by gearing for swinging the crane. The crane is placed in front of the melting furnace or furnaces, so as in swinging to bring the ladle under the tap hole and to carry it thence over the ingot pit. This is of a semicircular form, sunk into the casting pit in a position corresponding with the sweep of the crane. Several such ladle cranes and ingot pits are arranged in a line in front of a row of furnaces, there being by preference one crane and ingot pit to every two furnaces. When two opposite rows of furnaces are used there are two opposite lines of ladle cranes and ingots pits, those on the one side being by preference arranged in diagonal positions relative to those on the other side, so as to leave more room in the casting pit. One or more lines of railway are arranged in the casting pit for the wagons, into which the ingots are loaded, the loading being effected by an overhead travelling crane.

Royal School of Mines, Jermyn Street.

[FROM NOTES BY OUR OWN REPORTER]

LECTURE XXXIV.—The processes of tubbing the water back from the shafts have been, so far as regards the principle on which the work is carried out, sufficiently dwelt upon, but in the actual placing of it in the shafts and in portions of ground which have to be connected there are a great many other things to look to in respect to the hydrostatic pressure coming on the shafts with a different degree of force at one place as compared with another, by reason of which some parts require to be made of great thickness, and others of less. Suppose we have a light pressure near the surface and a heavy pressure at a lower point, then, based upon a wedging curb, there would be a continuous length of tubbing. Thus, in tubbing out any particularly watery measures below, the question will always arise as to whether it should be continued upwards, and form one continuous piece from the surface. It is not unfrequently the case that to shift somewhat of the pressure from one length of tubbing to another a kind of water-way is made between them. At the Shireoaks Colliery, for instance, at one place in putting in the tubbing they found a large amount of pressure, in consequence of the air being inclosed, or, perhaps, from an ebullition of fire-damp from the coal, so that it was necessary to have some opening for the escape of the air or gas from behind the tubbing, which in this particular shaft lines it throughout. In some cases the rise of water behind the tubbing forces any air that may be there into a state of compression severe enough to make it operate upon the wedging. To meet these difficulties, openings are always left at the commencement, to be closed up eventually when all is safe. It is, indeed, always best to have a communication between the various lengths of tubbing about which any uncertainty is felt, and at Shireoaks the pressure was relieved by putting in small pipes behind the tubbing, by which a continual stream of water is allowed to flow out. The only drawback from the excellence of this particular shaft is the great wear and tear of these pipes, probably on account of the acidulous nature of the water. In all cases the strength of the tubbing must be proportioned to the length, and so at the surface ¾ in. of cast-iron will suffice, ¾ in. up to 1½ in. may be requisite lower down, according to the circumstances of the case; but, as a general rule, the strength will be increased as we go downward. There is another question of importance with reference to cast-iron tubbing—how it shall be employed in upcast pits, where large fires are burning, where the products of combustion are considerable in quantity, or where water containing sulphates flows down the sides. Under such circumstances there is pretty certain to be a rapid corrosion, and good cast-iron is speedily converted into a material like graphite, which may be cut with a knife, and so become utterly incapable of resisting pressure; and cases have occurred in which both risk and inconvenience have resulted. Having referred to several examples of actual experience, Mr. Smyth continued by saying that in order to obviate the wear at tear of tubbing occasioned by the smoke and sulphurous fumes of the furnace a wooden lining has been proposed, which has been found effective, but it is open to the objection that it would necessarily be very dry, and readily take fire. Another suggestion is to line the shaft with thin fire-bricks, and this has been found very serviceable. But in both cases of lining, if any leakage should occur it would be impossible to say at what particular spot behind the lining, and timely repair would be impossible. Taking, however, one thing with another, cast-iron is now generally held to be the best material for tubbing.

Another class of tubbing is necessary where, in consequence of the running character of the ground, it is difficult to get in a suitable wedging-curb. A great many plans have been proposed to get over this difficulty. One of them is to begin the shaft much wider than it is intended eventually to be, by what is called "piling"—that is, by driving piles into the ground, and then putting in strong curbs, and within those a smaller series of curbs. The excavation being thus secured another series of piles is driven down, and curbs put in, and so on until a great depth is attained. The main objection to this plan is that in beginning with a circle of large diameter there is an enormous pressure, and the expense is very great.

Another plan occasionally employed is to put in lining planks at the side, and then curbs of wood, clamped together with iron braces, and on that a strong lateral arching of bricks, the mass being lowered gradually by digging out the ground beneath by degrees. There are many cases in this country where gigantic circular towers, 50 ft. in diameter, have been built at the surface on a curb, 3 ft. in width, with an iron shoe, such as I have before mentioned, and sunk in this way to a depth of 40 ft. The walls of the Thames Tunnel shaft were put in by this means. They were built at the surface to a height of 50 ft., and then afterwards sunk to that depth. It is necessary in these cases very frequently to have the centre of the opening deeper than the other part for the sake of drainage, and from that centre to pump out the water. Of late years cast-iron has been used very largely for purposes of this kind, being cast in rings, each in one piece. The first ring is laid upon a slight curb shaped below so as to enter easily into the ground. The rings have flanges, which are screwed together, pieces of sheet deal, or very thin iron, or even flannel, being put in to make the joints thoroughly effective. As these are placed one upon another, and the central ground being dug out, the continually increasing weight forces down the whole mass to the point where it is intended to be based. If care be taken an excellent shaft may in this way be carried down to a considerable depth. The objection to the plan is that if any accident occurs to any one of these rings it would be exceedingly difficult to replace it. Nevertheless, if the castings be strong enough, and perfect perpendicularity is preserved, there is no reason to apprehend accidents. It was on this plan that the foundations of the bridge over the Thames at Blackfriars were carried out. And a wonderful sight it was, for rings from 14 ft. to 18 ft. in diameter were not only sunk through the bed of the river, but through deposits of gravel and sand, until the firm rock below was reached. The great difficulty in cases of this kind is to get a watertight foundation, in consequence of the large pebbles and boulders being apt to occupy the lowest part of the depo-its.

One of the most interesting instances, in which natural difficulties, apparently insurmountable, were overcome was that of shafts sunk in the valley of the Loire. This valley is underlaid with coal measures, which are covered with sands, gravels, &c. Shafts lined with boiler-plates were driven down by pressure, or careful impact, but it was found that just at the bottom of the previous strata, where, in fact, the pressure was greatest, a bed of boulders came in and canted the shaft over, or prevented its progress. Pumping was impossible, it would have been as easy to pump dry the River Loire. The shaft was considered lost, but M. Triger, an eminent geologist and colliery engineer, was called in, and the idea struck him that the water might be kept out by the introduction of compressed air to counteract it. The pressure was one of so many pounds to the square inch, and the question was how to obtain a pressure of condensed air of the same density, so as to allow the men to get to the bottom, and remove obstacles to the downward progress of the tubbing. This was achieved by constructing an air-tight chamber in three compartments, into which compressed air was pumped from the surface until the water was forced out. The man at the bottom, thus enabled to work, filled the kibble with boulders, which were then drawn up into the middle chamber through a valve-door. The communication was then closed, and a similar door opened in the floor above, and so reached the surface without altering the condition of air in the chambers. These chambers acted in reference to the air like the locks of a canal, forming, in fact, an air-lock. At first it was considered by scientific authorities at Paris impossible that the men could work in such an atmosphere, but M. Triger tried it himself at a pressure of 2½ atmospheres, then of 3, and then of 3½, and took a regular turn at the work. It was found that the men could stand it very well, the only precaution necessary being that of making the transfer from the one to the other atmosphere gradual. M. Triger, indeed, submitted himself to a working pressure of 4 atmospheres, and except an uncomfortable sensation in the ears he found that he could stand it very well if only he passed through the intermediate stage with sufficient slowness. Steady men, of moderate habits, therefore, were easily got to perform the work.

In carrying out this ingenious contrivance M. Triger found himself at one time at the very extent of his power without being able to reap the full advantage, when a very curious accident occurred which at once suggested the remedy. The water which is driven back by the compressed air is carried up the shaft to the surface, ending in a snore-piece. After the work had gone on for some time, and the depth of the sinking increased the weight of the water column in the pipe so greatly that the pressure of the feeder could not drive it up, when one of the men at work in the lower chamber accidentally knocked a hole in the pipe with his pick, whereupon the compressed air rushed through the hole, and immediately a jet of water was thrown out at the top like the contents of a bottle of soda water. The intermixture of compressed air which passed through the hole rendered the column of water of so much less weight than the solid water, and hence this remarkable result. In another instance, too much pressure being applied by the air-pump at the surface the water was forced down to the bottom of the escape-pipe, when from the same cause a jet of water shot up to the height of 60 ft. M. Triger, of course, turned this phenomenon to account by a proper admission of air into the pipe, and the water was got rid of with regularity and success. This plan has been found to answer, not only in Belgium and Westphalia, but in our colliery districts. Accidents, however, have occurred from having too much air pressure, when the iron chamber has been lifted bodily up; and in one case in the North of France the rapid consumption of candles under so serious a compression of atmosphere caused something to take fire, and two or three men were burnt to death. It has been found, however, that this system of M. Triger's cannot be carried out except at certain moderate depths, and various modifications of it have been tried. For instance, at Seraing, in Belgium, the chamber was attached to the tubbing, and diagonal plates with stout girders were used to strengthen them, and it was forced down by gradual screw pressure.

Some very excellent work of this kind may be seen near the western extremity of the Westphalian coal field, where the Rhine and the Danube come together. In the valley there the beds of alluvial soft material are very thick, and divers attempts had been made to sink through them, sometimes, as in England, with cast-iron cylinders, and at others by towers of masonry built on the surface. Twenty years ago M. Kind suggested boring, *à niveau pleine*, and his plan was attended with a great amount of certainty and economy. After going down some depth the shaft was reduced from 24 feet to 15 feet. The boring irons were 4½ inches in diameter, the extremities being expanded into arms, forming what they call a "a sackbobrer,"—a sort of scoop or dredging apparatus. These arms were made to work round and round, and the sand being thus bagged and got out, the walling was sunk down gradually. In some cases, besides the weighting I have spoken of, impact is used, but by it there is danger of breakage, or of being thrown out of perpendicularity. M. Kind was afterwards joined by M. Chandron, and they carried out some remarkable borings, of which an account has been given in the Transactions of the Mining Engineers of the North of England, and further details may be found in the published records of the School of Travaux Publiques, or Public Works of Belgium. The shafts in question were sunk at a place called Mausage, between the well-known towns of Mons and Charleroi, where the coal measures are overlaid with beds of earlier date, just in the same manner as our own coal measures are with the New Red Sandstone. Some of the apparatus was exhibited at the last Exhibition at Paris; and I learnt that a number of attempts had been made to sink shafts down through a thickness of 160 yards of water-bearing strata, No less a sum than three-quarters of a million sterling had been expended, only to meet with one failure after another. At length an attempt at the mines of St. Avold and L'Hopital was successful, not only as having been carried out without any accident whatever, but they got down to a depth of 159 metres at a cost which was considered to be about one-third of what it would have been by the ordinary methods. This depth was attained, moreover, without any lining whatever, because the pressure of the water within the hole was equal to that outside it. When the tubbing came to be put in, the difficulty was how to obtain a water-tight joint. This was effected by means of what is called a *boîte de mousse*. The upper portion of the tubbing was suspended from beams above, and an opening of from 2 to 3 ft. high was made behind where the joint was to be. In this, moss was laid very evenly, and the tubbing was let down with its full weight upon it, and the moss being thus squeezed into all the crevices of the rock, and cement being filled in at the back of the tubbing, a thoroughly impervious joint was made, and the shaft rendered thoroughly water-tight.

CLEVELAND:

ITS PAST, PRESENT, AND FUTURE, IN RESPECT TO ITS MINERALS AND MANUFACTURES—NO. X.

Competition may be regarded as one of the greatest boons ever conferred on human society, yet it may also be looked upon as one of the greatest evils by which human society is surrounded. Competition is that passion which induces us to make fresh exertions to-day in order to surpass our own efforts of yesterday, that the greatest degree of excellence may rest with the last enterprise. It is a principle which is inherent in our nature, is presented to us in our daily duties, and is perceptible in every branch of industry, as well as in political, social, and other matters. To competition in a great measure we are indebted for our unrivalled machinery, and many of the best laws for the government of our country. In commercial and other matters it may be considered one of the greatest blessings ever conferred upon humanity, by inciting us to friendly rivalry in surpassing our own efforts of yesterday. But observe two armies in the field arrayed against each other: it is then, and then only, that competition is dishonourable.

We have remarked that this spirit of competition runs through all classes of society, for we find it influences the rag-gatherer in his bargains, and the tradesman in his dealings; it actuates the merchant in his speculations, and calls forth the powers of the student, and the qualities of the statesman. It is the stimulant of invention, the harbinger of progress, the fruitful cause of adversity, the cause of poverty, and the foundation of riches. This was the passion that was being developed in Cleveland just after the long strike of 1866, and we shall see whether it was successful.

Continental manufacturers, as we have shown, had gained a position which might well cause general regret in this country. They had been taking the orders which had previously fallen into the hands of Cleveland firms. It was now necessary, therefore, to offer special inducements to consumers of iron, in order to bring back their customers. It was consequently unanimously decided by the various firms in the district to fix the prices lower than the foreign manufacturers could supply the iron at, and orders soon entered Cleveland, and the mills, blast-furnaces, and other works were once again in operation.

The district had to do the best to recover its lost position, and, therefore, every appliance was introduced which was a readier means than the existing ones, and every process of manufacture which was an improvement on the old systems was readily adopted. Various changes were effected in blast-furnace plant, and the average capacity of the blast-furnaces was now about 12,000 cubic feet, and their production was at the rate of 320 tons per week. The consumption of material per furnace had decreased on the ton of pig-iron made, but the total quantity now used was larger, for not only had the furnaces been increased in capacity, but the number of furnaces was larger. The quantity of pig-iron made in the district was 602,062 tons in 1859, against 1,156,953 tons in 1867, and the coke consumed was upwards of 1,500,000 tons per annum, and the quantity of coal was very considerably in excess. To make this large quantity of pig-iron not less than 2,600,000 tons of ironstone were used, and 867,000 tons of limestone.

Heating stoves were also further improved, and to this period may many improvements be traced. Competition had aroused Cleveland ironmakers to a sense of their position, and they well knew that if they would swim they must strike out, and make a bold effort. In every part of the district the same feeling was experienced, and everyone exhibited the same intense desire to overcome the difficulties of their position. Nor were they long in seeing the results of their endeavours. The firm resolution they had made just after the long cessation of work to use every legitimate means for the attainment of their object—to supplant the foreigner, and reinstate themselves in the English market—had been constantly in their mind, and had been as fully carried into practical operation. They had laid hold of every means, both natural and artificial, and now had the great satisfaction of witnessing the gradual but sure retirement of the continental firms. Their trade was now very considerably improved, and the enormous make of pig-iron to which we have referred was disposed of without much difficulty.

But, perhaps, the attempts of our ironmasters would have been attended with less success had not some difficulty arisen between the continental workmen and their employers, which had the effect of stopping work entirely in those parts. The difficulty was precisely the same as we had passed through. The employers of labour had observed the efforts of the British manufacturers to recover their lost trade, and at once saw that prompt action must be taken to prevent this, which was prejudicial to their best interests, and, therefore, proposed a reduction in the rates of wages paid to their workmen. The workmen declined, and a strike ensued, and what followed is already mentioned,—they lost their position in the markets of Great Britain.

The great object which the employers had in view was now fully realised, and they wished to profit by the experience they had gained. They accordingly still more closely cemented themselves together to watch the interests of the iron trade, for which purpose associations were formed, and these were of great value. In addition to this they commenced a representative journal, entitled the "Iron and Coal Trades Review," which was a useful medium for the interchange of ideas and facts bearing directly upon the trades in which they were engaged.

It was also deemed expedient to devise some plan whereby all chance of so unfortunate an occurrence as a rupture in the relations of the employers and the workmen might be removed, this having been one of the chief causes of the recent protracted distress in the district. To this period we may, therefore, trace the origin of the Board of Arbitration and Conciliation for the North of England iron trade. This system of settling disputes originated in Nottingham, we believe, and proceeded from the mind of Mr. Mundella, M.P. for that town. It had for a considerable time been adopted in the lace trade of Nottingham, with excellent results, as a means of settling the disputes in wages and other questions between the employers and their operatives; and, acting on certain suggestions from eminent authorities, the principle was adopted in the iron trade of Cleveland and the North of England.

The Board consists of an equal number of employers and operatives, each being chosen by their own body. Thus the employers are selected from the members of the Ironmanufacturers' Association, and the operatives are selected from the delegates appointed by the workmen of the various works to represent their interests. There are also a President and a Vice-President, the former being an employer, the other an operative; and there are two secretaries, one of whom represents the employers and the other the workmen. These constitute the Board, and their decision is binding. In the event, however, of a dispute an independent person may be called in to act as arbitrator, and his decision is final. In order to supply the funds necessary for the maintenance of this Board, every operative is required to subscribe 1d. per month, which is deducted from his wages, and in proportion to the total amount thus subscribed the employers contribute a similar amount. This met the approval of both classes; both had seen the evil effects of strikes and lock-outs, and, therefore, both were exceedingly anxious to prevent such occurring in the future. The harmony between the two classes, which we maintained in a previous portion of this article as being essential to the success of both, was now established, and there was every prospect of a happier period than the one passed through.

Everywhere were proofs of a revival of trade, and there were indications of still greater prosperity looming in the distance; and it was then the workmen believed the time was come when they were entitled to an advance. They, therefore, applied through their representatives, but their request was not approved, and consequently the services of Mr. Rupert Kettle, of Wolverhampton, a County Court Judge, and a gentleman of considerable experience in disputes between similar classes, were secured, and he was asked to act as arbitrator, and having courteously complied, his decision was favourable to the workmen. Facts and figures were submitted to him, and he then gave the matter his impartial judgment and decision. The new system increased in favour, and was established. Its superiority to that system which had been previously adopted was vast, as by it there was no danger of our trade suffering, and causing tales of suffering and misery which would yet have been untold.

The years 1868 and 1869 were remarkable for the great activity which characterised the iron and mineral trades of Cleveland. The production of pig-iron had further increased from 1,147,900 tons in 1867, to 1,233,418 tons in 1868, and 1,459,508 tons in 1869, whilst the consumption of material—that is ironstone, limestone, coal, and coke—had proportionately increased.

Within the district blast-furnaces were being erected on every hand, and the prices of pig-iron were satisfactory. Forges, foundries, and rolling-mills had been multiplied, and shipyards, bolt, nut, and rivet works, and other branches of trade were prosperous. About this period new wire works were also commenced, and this was a new industry in the district. Materials of every description were advancing in price, and coal, which in 1860 was 4s. per ton, was 6s. per ton in 1869; over the same period coke advanced from 10s. 6d. per ton to 13s. at the collieries. The district continued to progress, and there was the greatest confidence expressed that a long period of success had been entered upon.

It was thus when 1870 was ushered in. The several branches of trade were very animated, and prices of every description of material and produce were most excellent. Just then, however, war between France and Prussia was declared, and this had the effect of depressing trade, so far as engagements with continental firms were concerned, and prices were subjected to a heavy fall. The orders on home account, nevertheless, were tolerably numerous, and the state of trade was sound, although there was not, of course, that buoyancy which had been shown previously to the outbreak of hostilities between those two nations, which import a large quantity of Cleveland iron. The blast-furnaces erected during the previous year were now in active operation, and the production of pig-iron in 1870 was 1,695,377 tons, against 1,459,508 tons in the previous year, or an increase of 235,869 tons. The general aspect of affairs in Cleveland was not altogether satisfactory, but it was hoped on the termination of the war prices would improve.

FOREIGN MINING AND METALLURGY.

The activity in affairs appears to have become greater than ever in the Belgian iron trade, and all the works are more or less overdone with orders. A price of 4*l.* 8s. per ton for refining pig is accepted in the Charleroi district, while one of 4*l.* 4s. to 4*l.* 8s. per ton is current in the Liége basin. Casting pig continues its upward movement, and it is difficult to say at present where it will stop. The quotation is about 5*l.* 12*s.* per ton. In the Liége district No. 1 iron is "tarified" at 8*l.* 16s., 9*l.*, and even 9*l.* 4s. per ton. Rails bring 9*l.* 4s. per ton, and no reduction in prices is anticipated before the close of the year. This state of things is attributable to the continually increasing scarcity of pig and iron, and to the superabundance of orders.

In France, as in Belgium and England, the price of iron continues to rise. The proprietors of ironworks have to congratulate themselves upon the extraordinary demand which prevails at the present moment, and from which they can profit in order to establish selling prices at a point which, after all, is scarcely *en rapport* with the marked augmentation in the price of pig and combustible. At St. Dizier iron from coke-made pig is quoted at 9*l.* 12s. to 10*l.* per ton; and puddled iron from charcoal-made pig 11*l.* 4s. to 11*l.* 8s. per ton. First-class sheets, coke-made, have brought 11*l.* 8s.; ditto, charcoal-made, 12*l.* to 12*l.* 8s. per ton. Axles have made 11*l.* 16s. to 12*l.* per ton. A rumour to which currency was given last week as to the erection of a blast-furnace by MM. Laduron and Co. has been contradicted; the concern in question confines its operations, it appears, to the sale of minerals obtained from its concessions. The ironworks of the Nord have carried the price of their No. 2 iron to 10*l.* per ton, with a scale of 16s. per ton per number. Ordinary puddled plates, No. 2, have been readily bought at 12*l.* 16s. per ton. In the Meurthe and the Moselle ordinary refining pig has been quoted at 4*l.* 2s. to 4*l.* 4s. per ton. It is announced from Paris that the depôts of the house of Wendel and the house of Karcher and Westermann have disappeared from the French capital. The house of Dupont and Dreyfus (Ars-sur-Moselle) now alone maintains a depôt at Paris with iron purchased from other producers until the Pompéi rolling-mills in the Meurthe and Moselle district are again brought into activity.

An advance of 4*l.* per ton has occurred at Paris in Chilian copper in bars; other descriptions have also risen 2*l.* per ton. Chilian in bars, delivered at Havre, has brought 100*l.* per ton; ditto in ingots, 102*l.* per ton; tough English, 100*l.* per ton; and Corocoro minerals (pure copper), 98*l.* per ton. At Havre prices remain very high, but in consequence of the reduction in the stock there is comparatively little passing. The intelligence received from the German copper markets shows great firmness in prices, and much animation in affairs. Tin maintains very high prices upon the French markets. At Paris, Banca to be delivered at Havre or Paris has been dealt in at 168*l.*; Straits, 162*l.*; and English, to be delivered at Havre or Rouen, 160*l.* per ton. The German tin markets have advanced in consequence of the encouraging advices received from Holland and England. At Rotterdam transactions of some importance have taken place in disposeable Billiton under sail at 94 to 95 fls. Banca remains without much business at 97 to 97½ fls. The lead markets are still tending upwards. At Paris, French lead has made 20*l.* per ton; and Spanish, to be delivered at Havre, 19*l.* 12*s.* per ton. The German lead markets have also indicated a further upward movement in quotations. A slight fall is observed in zinc upon the French markets. Silesian zinc, to be delivered at Havre, has brought 23*l.* 16s. per ton; and other good marks, to be delivered at Havre or Paris, 23*l.* 12s. per ton. In Germany the tendency of the article has been very firm.

It is officially announced by the Belgian Minister of Public Works that contracts are about to be let for the supply of cramps and Vignoles rails required for the establishment of a line from Brussels to Luttre. Contracts are also about to be let for the supply of wheels for locomotives and tenders, axles, &c., for the Belgian State Railways. So great is the activity prevailing in Belgian mechanical and metallurgical industry at present that at recent adjudications attempted by the managers of the Belgian State Railways scarcely any tenders have been received. A few months since there would have been a most inveterate competition for the work offered. The Belle Vue (Belgium) Colliery Company has announced a second dividend for 1871, or 2*l.* per share. The Elbing (Germany) Company, for the manufacture of railway plant, will pay, May 1, a dividend for 1871, at the rate of 9 per cent. per annum. In consequence of "events," the net profits of Commentry Collieries and Fourchambault Montlugon, &c., Forges and Foundries Company for 1870-71 were only 21,560*l.*; the sum will be applied to the sinking fund service, and no dividend will be paid to the shareholders for 1870-71. The capital of the enterprise is intact, the works are in full operation, and it may be hoped that the present exercise will yield excellent results. The meeting of the shareholders just held approved the accounts presented to it, and voted a distribution of 1*l.* per share, representing the deferred dividend of 1869-70, which will be paid half April 15, and half Oct. 15.

The French coal trade has not lost any of the activity by which it has been distinguished for some time past. Orders succeed each other in a satisfactory manner, and deliveries are made with energy. Prices everywhere display great firmness, and a further advance is anticipated in coke. In the department of the Maine-et-Loire four out of nine coal mining concessions granted are not worked; these are the concessions of St. George's-sur-Loire, Doué, Chateaufond, and St. George's-

Chatelaison. The mines in working are Montjean, the Désert, the Layon-et-Loire, and St. Lambert-du-Lattay. All these enterprises employ only 719 workpeople, or about 100 less than were employed before the war. The production of the collieries of the Maine-et-Loire amounted in 1870 to 52,360 tons; this total shows a reduction of 22 940 tons as compared with that for 1869. The department of the Corrèze has four coal mines—St. Bonnet-la-Rivière, Argentat, Cublac, and Lapleau. The three last were worked in 1870, but the total production of the department for the year did not exceed 2763 tons. In the department of the Hautes-Alpes there were 42 mines of anthracite coal, of which 41 are situated in the arrondisement of Briançon; these were almost all worked in 1870, but only to meet the requirements of local consumption. The total production of the basin remains stationary, at between 6500 and 7000 tons. The inferior quality of the anthracite coal of the Hautes-Alpes prevents its acquiring a footing upon distant markets.

Great activity continues to prevail at the collieries of all the Belgian coal basins, and their production is generally engaged for some months in advance. Prices are very firm, with a very marked tendency upwards as regards future contracts, and it is expected that next winter coal will command altogether exceptional rates. The price of coke in the Charleroi basin is generally maintained at 1*l.* per ton. Freights for Paris remain at 8*s.* per ton, without any prospect of a decline. The Belgian Government has proposed to the French Government that Belgian combustible minerals imported into France shall in future be subject to the same duties as were enforced by the treaty of May 1, 1861. Contracts are to be let on May 1 at the Charleroi, Ghislain, Baume, and Liége stations for coal and coke required for the Belgian State Railways.

MINERAL WEALTH OF SARDINIA.—Persons desirous to form an idea of the immense mineral wealth of Sardinia should procure the map annexed to Signor Sella's report on its mining industry. This map is on a large scale, and all the mines as yet worked are marked upon it in colours indicating the nature of their produce. Upwards of 460 mines are thus marked and numbered, and their names and other particulars are given in the margin. Legislators have been careful to stimulate mining discovery in the old Sardinian States. In the Island, in Piedmont, and I believe also in Lombardy, extraordinary advantages are secured to the discoverer of a mine, who by the mere fact of such discovery becomes its owner. This is hard upon the proprietor of the land, who has either to give up part of his property, or to purchase the mine of the discoverer. A case in point is that of the Duchessa Mine, mentioned in a former letter, which is comprised in the extensive property of Signor Semenza, who has had to give up 400 hectares, or about 1000 acres, of his land. The law also may seriously affect the rights of the railway company, whose concession included a grant of 200,000 hectares of land, in consideration of which a smaller subsidy was accepted. Mining discovery has already began to infringe on this grant. A bill was brought into the Italian Chamber to modify the law, but Signor Sella opposed it, being desirous to maintain a system favourable to the development of the mineral wealth of the Sardinian provinces, and it was accordingly lost. When legislating for the mining districts it might be desirable to restrict the employment of young children in work ruinous to their growth and health. It was pitiable to observe the sallow, unhealthy countenances of the children employed in some of the lead mines we visited. They get a complaint resembling what is in England called the painter's colic. In the antimony mines, and in those where antimony is mingled with other metals, children are liable to lose the use of their hands, and dogs, cats, chickens, &c., cannot live. As a geologist, as well as in his capacity of Finance Minister, Signor Sella takes strong interest in the mining industry, and he may easily find opportunities of improving the legislation which now regulates it. Of its immense importance there can be no doubt. There are hills and mountains in Sardinia which are entirely composed of rich ore. "You are riding over a mountain of zinc," an English resident said to me we as toiled our way over detestable tracks up to the Duchessa Mine, which is only two years old, and yields its 20,000 tons of ore per annum. The largest mines in actual working are in the south-west district of the island, a great number being in the neighbourhood of Iglesias. But minerals exist in abundance in the Luconi, Navro, and Ozieri districts, and also in other parts of the island, where mines cannot be successfully worked on account of the difficulty of transport—a difficulty likely to continue until at least the main lines of railway are made.

TIN IN NEW SOUTH WALES.—We have had occasion to refer in several of our recent summaries to the discovery of tin in the norther portion of New South Wales. These discoveries have extended over a vast area of country, where the granitic comes down into near contact with the secondary formation. The localities in which the deposits have been discovered are as yet confined to the Macintyre river, where deposits of ore mixed with alluvium, and of stream tin, have been struck over an area of some ten miles by twelve, and to the Oban district, being on the first fall from the high table-land of New England down to the Clarence river. In the latter it has been almost exclusively stream tin that has been hit upon. It is questionable, however, whether as yet a true lode has been found, but the works have been up to the present mere surface working, no shaft or sinking having been put down to any great depth. Seeing the large amount of alluvial deposits both of tin ore and stream tin, the discovery of the true lode is only a question of time, patience, perseverance, and systematic enquiry. Ore from the different localities has been brought down to Sydney, and been smelted at Newcastle, where, with only insufficient appliances for the particular work in hand, highly satisfactory results have been obtained, and the blocks of tin in one instance, weighing 1 ton, have been exhibited at Sydney, whilst the assays made by competent chemical analysis have given results varying from 60 to 80 per cent. of metal from the wash. Three tin mining companies have been already floated. The Newstead, having a property of 1000 acres, was put upon the market for 60,000*l.*, 10*s.* per share deposit, and 10,000 shares were taken up within the first hour. The New Cornwall, with 280 acres, was put up at 30,000*l.*, 2*s.* 6*d.* deposit, and the whole of the shares were placed within an hour and a half of the list being opened. The Belmore, with a nominal capital of 10,000*l.*, was worked in a different way by means of promoter's shares, and we believe the whole have been taken up. Since then the Sydney, with a capital of 60,000*l.*, and the Mount Mitchell of 75,000*l.*, have been brought on to the market.—*Sydney Morning Herald*, Feb. 26.

SMELTING IN PITTSBURGH.—Among the industrial enterprises of Pittsburgh the smelting of silver ores promises to be an important occupation. A furnace has already been erected, and is now running successfully, and in all probability it will serve as the nucleus of one or more extensive smelting works where ores of the precious metals may be cheaply reduced. Large quantities of ores from Utah and other western territories are forwarded in sacks by the Union Pacific Railroad and its connections with New York, whence it is shipped to Swansea, in Wales, passing directly through Pittsburgh on its way. The expenses of transportation over this long route are very heavy, while the cost of smelting in Utah, owing to various causes, is much greater than it would be in a city so favourably situated as Pittsburgh, where fuel of the best quality exists in abundance. The experiments hitherto made prove that the silver ores from the Flagstaff, Cressus, and other characteristic mines may be smelted at a cost not exceeding $5 per ton, while the transportation charges are much less than would be the expense of smelting at the mines. As these experiments are being conducted by experienced persons, and have already progressed favourably, they may lead to the establishment of permanent works, and tend to keep the profits of smelting ores at home, instead of them sending to foreign metallurgists.—*American Engineer and Review.*

RICHMOND CONSOLIDATED.—The *Eureka Daily Sentinel* states that the Richmond Smelting Works are to be supplied with new boilers and engine of the largest pattern. The machinery has already been ordered from San Francisco. It is thought that 60 days will place these works in splendid order for the summer's run. There is no lack of ore, and when the Richmond fires up the bullion returns will satisfy the anticipations of the most sanguine. Work in the Richmond furnaces is progressing rapidly, and everything is being got in readiness for the machinery, now on the way. When again in operation these furnace will equal anything in the world in the matter of producing bullion. It is certain the company have one of the finest mines in Nevada, and recent workings are developing large bodies of ore every day, the supply being inexhaustible.

THE EUREKA CONSOLIDATED MINE.—The Eureka Consolidated, of Eureka district, is perhaps to-day one of the most valuable mining properties in the United States, if not in the world. Certain are we that there is nothing in Nevada to compare with it. Late developments establish the continuity of the ore, almost beyond a doubt, for a distance of 1000 feet; the entire length of the claim. The ore channel, which has been penetrated to a depth of 215 feet from the surface, ranges from 10 to 70 feet in width. Taking the average of the ledge, 15 square feet will yield 1 ton of ore. Estimating the body of ore already developed to be only 40 feet wide, 215 feet deep, and 1000 feet long, and we have 305,606 tons, which, at $90 per ton, present average assays, would return the enormous sum of $27,599,940. But to be entirely safe let us reduce both the amount and value of the ore just one-half. This would give 152,3 3 tons, at $45 per ton, the gross yield of which would be $6,899,985. That this is far below the actual value of the ore now in sight no one who has lately inspected the mine will for a moment deny. Competent judges, in fact, estimate the present available resources of the mine at not less than $20,000,000. This, remember, is only the ore above the 215 feet level. Below that point the supply gives promise of increasing rather than diminishing. At the greatest depth yet attained the ore channel is still widening, and also largely increasing in value, as has been demonstrated by a great number of assays since the late unprecedented development. The truth is, there is simply a world of ore in sight. It is gratifying to record these facts, because they place Eureka in the foremost rank of mining districts on the Pacific Coast, there being any number of mines in the immediate vicinity of Ruby Hill, which furnish assurance of producing untold millions. Some important improvements are to be immediately inaugurated by the company, reference to which may not be out of place here. First, a narrow-gauge railroad is to be built from the mine to the reduction works, at a cost of $35,000. The survey has already been made. Two sets of steam hoisting works are to be placed on the mine, and two additional furnaces, capable of reducing 50 tons each per day, are also to be erected. These latter improvements will involve an expenditure of about $30,000, making an aggregate outlay of $65,000 for contemplated improvements. When the seven furnaces are once in full blast they will smelt about 300 tons of ore per day.—*Eureka Sentinel.*

GOLD AND COAL IN NEW ZEALAND.—A letter (Wellington, Feb. 21) says—"The Thames Mines are suffering a temporary depression, chiefly in consequence of the Caledonian having worked out the rich seam of gold which has lately been giving such enormous returns. As against this, however, we find the Coromandel reefs giving the most encouraging indications, and on the west coast of the Southern Island Inangahua reefs, some 60 miles inland up the Buller river, are found to contain gold over an area of several square miles; and adding to the value of that discovery, it is also found that an extensive seam of good coal abuts upon the auriferous reefs, so closely indeed that the working machinery for one of the mines is actually imbedded in the coal. It is early yet to decide upon the value of the field, but there is every indication of its being able to support a very large mining population."

VICTORIAN GOLD COMPANIES.—In the Stockyard Creek district, in Gipps Land—the last newly-discovered gold field of the colony of Victoria—the great claim is the Cross Reef Mine, which has eclipsed in yields nearly every other mine in Victoria. This company is composed of 10,000 shares, paid up to 2*l.* 2*s.* each, and held by 75 persons. In 1871 it paid upwards of 105,000*l.* in dividends, and in 1872, up to the 23d of February, it paid 19,000*l.* The average yield of gold is 2½ ozs. per ton of quartz crushed. One shareholder holds nearly one-fourth of the mine, and another nearly one-fifth. It would be impossible to name the numerous companies now in profitable working at Sandhurst. The Great Extended Hustler's Tribute Mine, the yield from which since October last, when the reef was found, has been unprecedentedly large, still maintains the pride of place as the leading mine of the colony, its last return for the fortnight ending the 24th of February having been 3146 ozs.

CLIFTON MINE.—Extract from Prof. Charles S. Richardson's correspondence:—"The reports coming down daily are of such a flattering character that I am a little dubious in repeating them as given. I will, however, tell you what Capt. Rodham, the agent of the Clifton Company, told me on Saturday night. He says on clearing the bottom of the eastern shaft, and sinking a few feet, they have come upon a course of nearly solid silver-lead ore, from 20 in. to 2 ft. wide, and that the lode is not less than 5 ft. wide, with strings and spots of ore all through. Now, leaving out what may be in the main gangue of the lode, and taking the leader alone, this will produce 10 tons per fm. What it is worth per ton I cannot say. An offer of 25*l.* per ton was made for the ore on its appearance without an assay, merely relying on the chances. Now, if this ore is really worth what is said, then the present end is worth $1370 per fathom. Our territorial assayers' assays are so perfectly unreliable that I have not cared to have any samples tested. I give you an instance in proof. From the second shaft they raised some most beautiful steel-grained ore the other day, and I guessed it at about 75 ozs. in silver. This sample was divided into two parts; one we retained, the other we assayed here, and gave us a return of of only 22 ozs. Feeling there was a mistake somewhere, accidentally or willingly, I sent—or rather Mr. Dowlen, the company's agent did—the other half sample to our Columbian reduction works, at Ward, assaying 94 ozs. per ton. Now, what do you think of this?"—Dated from Central City, March, 1871.

NEVADA.—The White Pine *News* of March 16 says—W. F. and Co. shipped bullion yesterday to the amount of $27,903·37. Ten bars, amounting to $13,695·93, are credited to the Eberhardt and Aurora Company.

PAYING MINE.—The shipments of bullion from the Raymond and Ely Mine from March 1 to 28 amounted to $10,700 per day.

DEEP SHAFT.—The Yellow Jacket shaft on the Comstock ledge is down to the level of the Sutro Tunnel, and is being sunk deeper. The whole depth is, according to the Virginia *Enterprise*, 1898 feet, no water being found in the bottom. This is the deepest shaft on the Continent.

SALES.—The Eureka *Sentinel* says that the Tip Top Mine has been sold to the Richmond Company for $70,000 cash. The Zapata Mine, at San Rafel, Lower California, has been sold to San José Capitalists for $20,000. It is the intention of the purchasers to erect a mill.—*Scientific Press* (San Francisco).

FOREIGN MINES.

DON PEDRO (Gold).—Copy of telegram from Lisbon:—Produce to March 30, 6660 oltz.; estimate for March, 8660 oltz.

ALMADA AND TIRITO.—The directors have received the following from Mr. Clunes:—Profit for February, $7129 13c.

CAMP FLOYD (Silver).—Telegram from Mr. Bowe, one of the directors now in America:—Camp Floyd Mines valuable; 1700 tons ore on dump; raising 30 tons daily; average value per ton, $70; deepest incline, 80 ft.; width pay ore at bottom, 16 ft.; assay, $80. Mill and furnace starts June 1. Things going on satisfactorily." Estimating the ore on the dump at $70, it would be worth the sum of 23,800*l.*

STAR OF NEVADA (Silver).—The directors have received the following telegram from their superintendent:—"Shipped $3000 of bullion; more coming."

EBERHARDT AND AURORA.—Thos. Phillpotts, Eberhardt, Hamilton, Nevada, April 1: I send my usual monthly report on mines, mills, &c.—Ward Beecher: Continuing the east drift from the Ladies' Chamber, to make connection with the body of ore already exposed above.—N. Aurora, North End: The ore in the Ladies' Chamber continues of a fair average quality. The quantity is not at all diminished.—North Aurora, South End: No alteration since last month's report. The quality of the ore, as shown by the weekly assays telegraphed, continues very good; the majority, indeed, too rich to crush by wet batteries. The whim and whim-shed completed. We are hoisting night and day from the Ridsdale shaft.—Eberhardt: Three men working south-west of the Keystone shaft, in a block of ground not yet prospected. As the weather improves, and the snow melts, I propose continuing this work. The men mentioned above assist, when required, on the tramway.—Tramway: Working well; but the last rope sent is not of good quality, the wire in many of the strands being too brittle.—International Mill: Have converted one battery of 10 stamps from wet to dry. We have now 40 dry stamps running; and I purpose, as soon as I can get lumber, converting the remaining 20, as our ore is too rich for the wet process. We have demonstrated the fact that the yield of the dry batteries is greater than from the wet, even in the same grade of ore; hence it is wiser policy to stop the wet stamps, at all events for the present.—Oasis Mill: Running on tailings: will clear up to-day, when the result of the run will be shown.

BENSBERG (Lead Mining and Smelting).—J. W. Hoffmann, April 20: The newly uncovered carbonate improves in thickness and richness, assaying partly up to 60 per cent. of lead. Since removing the engine to its present position the mine has been pumped almost dry; we are now digging trenches in the open cast, so as to drain off the water, and shall be enabled to get ont wash ore again by the end of this week. The new shaft is now 14½ ft. deep, all timbered. We have set the sinking to three men for 2*l.* 5*s.* per double meter (80 in.) to sink and timber. The water begins to come rapidly, which we are pumping out with the hand pump. In sinking the shaft a small vein of carbonate was struck on the east side, thus demonstrating that the carbonate also continues in this direction. In other respects there is nothing of particular importance to report.

CAPE (Copper).—Capt. Tonkin, Feb. 29: The stopes throughout the mine have yielded well during the month, and we anticipate that we shall be equally fortunate with the workings in March. The superintendent reports that having taken the weight and assay of the surplus ores collected from the doustings of former years, and of ores reserved to guarantee the weights of 1870 and 1871, the quantity is found to be a surplus beyond the figures given in the previous monthly reports, of 360 tons, averaging about 30 or 32 per cent. Returns for February—yield from Ookiep, 575 tons of 33 per cent.; from Spectakel, 80 tons of 32 per cent.—Railway: Transport for fortnight ending February 24, 84 tons up and 190 tons down. Bill of lading is received for 525 tons of ore, per Juliet Daniel: 139 tons of regulus were sold by public ticket on 9th instant at 19*s.* 3½*d.* per unit, and 14 tons of ore at 19*s.* 3*d.* per unit, realising approximately 626*l.* and 36*l.* respectively. The 670 tons ore, and 57 tons of regulus, ex America, Martha Stevens, and steamers, have been put forward for sale on 7th proximo by public ticket. [The better classification of the ores now adopted in the colony enables the directors to report the assays. The percentages given are those received from the mines, the mode adopted there being to assay the ore by the humid method, and make such a deduction as it is considered will make the units agree with the results at Swansea. The attention of the shareholders is called to the foot note at page 20 of the colonial officers' reports lately issued in reference to the assays. Until the ores have been properly crushed and sampled at Swansea it is impossible absolutely to depend on any assays that may be obtained, and this liability to error should be especially borne in mind when any sudden alteration of importance occurs in the percentages stated in the slips issued from time to time.]

[For remainder of Foreign Mines see to-day's Journal.]

STEAM LINE FROM NEW YORK TO CARDIFF.—The following letter has appeared in relation to the projected line of steamers to ply between New York and Cardiff, carrying ore for reduction. It will be of much interest to the mining companies operating in Nevada, Utah, New Mexico, and Colorado, where most of the smelting ores are produced. The letter is written by Mr Boyle:—"The object of my visit to America is the establishment of a line of steamers between New York and the South Wales ports in the Bristol Channel. Cardiff is the port to which the vessels will sail, it being the only one in that part of the country at present capable of admitting first-class steamers of the size we are building. However, we intend to carry from America at the same rate of freight to all the British Channel ports, so that this line of steamships may be said to be a direct line from New York to Swansea, among other ports. The consignments brought to Cardiff for Swansea are to be immediately transhipped into our own coasting steamers and forwarded thither without further cost. I believe this fact will interest all engaged in the shipment of ores to Swansea, or England generally, and who have hitherto been sending them to Liverpool. This will no longer be necessary or expedient; and inasmuch as they are now beginning to smelt copper and silver ores at Cardiff, it seems likely that the course will come to be to consign direct to Swansea or Cardiff, the ores which are now sent to London, and thence round by sailing vessel to Swansea. It is evident that the saving of this last item of cost—the freight, 12*s.* 9*d.* from Liverpool to Swansea—will add considerably to the value of the ores, and tend to benefit those engaged in this business. I think if the American railways can be induced, in their own interests, to reduce their rates to a proper figure, the refractory ores may be taken profitably to Europe, and thus a new branch of mining operation and adventure be happily inaugurated. And in this my line of steamers will be a valuable contributory part. In this view I am in communication, or shall be shortly, with that section of the railroads whose action at present is the greatest obstacle to the transmission of ores."

COLLIERY EXPLOSIONS, AND THE WEATHER.—A paper on this subject has been read before the Royal Society. It was the joint production of Mr. Robert H. Scott, F.R.S., director of the Meteorological Office, and Mr. Wm. Galloway. After reviewing former papers on the subject, it was shown that no "seasonal periodicity" existed in explosions, as none was exhibited by 1369 explosions extending over the last 20 years. At the same time it was remarked that the number of serious explosions involving the loss of 10 or more lives had seriously increased of late years. The main substance of the paper consisted in a comparison of the dates of all the explosions, fatal and non-fatal, which had occurred during the years 1868, 1869, 1870, with continuous records of the barometer and thermometer, from the observatory at Stonyhurst, near Preston. The dates of the fatal accidents were taken from the official reports, those of the non-fatal ones were supplied by the colliery inspectors, and the list was nearly complete. The meteorological causes for explosions were explained to be sudden falls of the barometer and sudden rises of the thermometer, and it was shown that out of 750 accidents during the three years 48 per cent. were related to changes of the barometer, 22 per cent. to hot weather, while 30 per cent. were not attributable to either of the above causes. The percentage of the separate years are almost identical with those given above. The paper then described how if the ventilating current in a mine become itself contaminated with gas even to a slight extent, this would have the tendency to engender explosive mixtures in places where the air was previously safe. The effect of [illegible] weather in stopping natural ventilation was described at some length, and it was shown how the first warm days in spring usually were marked by explosions, owing to the arrangements for summer ventilation of shallow pits not being in operation. A case was cited in which the Inspector had declared the cause of an explosion to be inexplicable, the fact having been that he had seen the mine on a cold day, while the accident occurred on a warm one. In conclusion the authors stated that they considered that many of the explosions were referable to atmospherical causes, and that it behoved colliery proprietors to keep a careful watch over their ventilation, by recording continuously the quantity of air passing through each mine, and they quoted George Stephenson's opinion that in most cases of explosion the ventilation has been more or less at fault.

COAL TRADE OF AMERICA.—The annual Statistical Register of the Coal and Iron Trade for 1871 has just been issued by Messrs. Bowman and Ramsey, of the *Miners' Journal*, Pottsville, U.S., and contains not only the usual mass of valuable information relating to coal and iron, but also some useful statistics of the petroleum trade; and an article by Mr. S. Harries Daddow, M.E., on the Panel System of Working Coal, which will prove extremely valuable to the profession. The Register is edited as heretofore by Mr. B. Bannan, and from the clear and methodical manner in which the whole of the information is given it would be difficult to suggest where improvement could be made. The paper on the Narrow Gauge Combination Railway System proposed by Mr. Wilder is particularly interesting, and although designed for a special purpose the plan would doubtless be applicable with slight modification to branch railways generally. The book is remarkably well collated, and altogether well worth attentive reading and preservation for future reference.

PERUVIAN INTERNATIONAL EXHIBITION, 1872.—At a meeting of gentlemen interested in the success of this Exhibition, recently held at the Cannon-street Hotel, the mineral resources of Peru were very favourably referred to. Colonel JOSIAH HARRIS (the Chairman) who is the Commissioner of the Exhibition in London, remarked that the mineral riches of Peru were proverbial. Humboldt, he continued, had estimated the production of silver from the sixteenth century to 1803 as of the value of 70,000,000*l.*, but in recent times the decadence had been great, arising chiefly from political events; and strange to say, though no country was richer in mineral wealth, there was only one English mining company (the Bellavista) at work in all the country, and he was happy to say that they were so with a prospect of great success. Although gold and silver were the coaxers of men to leave their homes and country in many instances to suffer toil and death to obtain them, the true wealth of a nation was its coal and iron—these Peru had in abundance. It had been his lot and privilege to be engaged by the Peruvian Government to search for coal and iron, and in several provinces he discovered numerous beds of coal both bituminous and anthracite. Iron ore abounds in every province, and ore from a lode within 6 miles of Lima he had run into pigs, &c., in the presence of his Excellency the President and the several Ministers, amongst whom was the respected Great Senior Galvez, and he is proud to say an Englishman made the first ore in Peru. As regards copper within 2 or 3 years the railways now constructed, and in course of construction, will bring down an immense tonnage, fully rivaling Chili. There is room for any amount of capital to develope the great mineral resources, that must leave immense profits to the workers. Five years since only 40 miles of railroad existed in that country, now 400 miles were completely finished and being worked. About 1000 miles were in course of rapid construction, and 500 miles surveyed and about to be commenced. (Hear, hear.) Taking the population of Peru in comparison with England, at no period in the English or any other country's railroad history had such progress been made. No greater engineering feat of the nineteenth century could be recorded than the construction of the Callao and La Oroya Railroad; and when completed to the navigable part of the River Amazon, communicating with Lima and Europe, the distance would be achieved in 23 days. On one part of the line there was a bridge being built 572 feet in length, supported on iron piers 252 feet in height, and in connection with this bridge, which would be the highest in the world, near the summit there would be a tunnel 1 mile in length at an altitude of 16,000 feet above the level of the sea. This and other mighty works were being carried out in a country where mules could scarcely find a footing. Altogether, the facts brought forward showed the increasing prosperity of Peru, and it is to be hoped that it will give the friends of that country confidence that with the increasing wealth and requirements their enterprise would bring returns exceeding their expectations.

BURNING PULVERISED FUEL.—The furnace proposed by Mr. W. HARTMANN, of Swansea, is fitted with a hopper for the reception of coal dust, and the discharge of fuel is regulated by means of a grooved roller or its equivalent, to which a slow motion is given. In connection with the contracted discharge passage of this hopper is a feed pipe which leads directly to a combustion chamber. Into this feed pipe he throws a blast of air or a steam blast or a mixture of the two. As the fuel drops into this feed pipe it is met by the blast and carried forward to the combustion chamber. In order to ensure the proper mingling of the blast and fuel, and thereby prevent a deposit of the fuel in the combustion chamber, he mounts in the feed pipe, near its exit end and behind its last bend, a turbine or screw by giving a rapid rotary motion to which an intimate mixture of the blast with the fuel is effected.

PREVENTING PRIMING IN BOILERS.—The object of the invention of Messrs. STOCKLEY and STAINTON, of Harton and South Shields is to prevent priming in steam-boilers by separating the water from the steam on their passage from the boiler to the engine. This is effected by intercepting the steam on its passage from the boiler to the engine and causing it to take a spiral and downward course in a vessel enclosing an inner pipe with orifices, through which the steam is caused to pass to the steam-pipe, the water passing into a pipe (at the bottom of the said vessel) leading to the hot-well, feed-pump, boiler, or elsewhere required.

PREPARING SAFETY GUN-COTTON.—The invention of Messrs. NICHOLSON and PRICE, of Herne-hill and Lincoln Inn-fields, relates to the preparation and treatment of gun-cotton, in order that the presence of any acid contained in the gun-cotton or produced or generated by the decomposition of the same may be detected, and consists in mixing or incorporating with gun-cotton, by preference, when in a state of pulp, and also by preference when in a moistened condition, such substances, either in solution or in a finer divided condition, as are capable of indicating the presence of an acid either by changing of or by the disappearance of their original colour.

IMPROVED MACHINES FOR ROLLING METAL.—A pair of rolls has been invented by Mr. ASA JOHNSON, of New York, U.S., the surface of one of which is smooth and that of the other studded over with protuberances. The rolls have an inner, solid, or tubular cylinder, and an outer shell, composed of a series of removable segmental plates. The segmental plates are studded on their convex surfaces with the projecting heads of rivets, whose shanks pass into said plates. The rolls have an interior tube of sheet metal corrugated longitudinally, an exterior shell of plain metal, and an intermediate cylinder of cast metal. The journal bearings of the hollow rolls have a connecting tube. He casts the hollow cylinders around a sheet metal cylinder filled with water, and inside of an outer tube, with water surrounding the same. He combines with the hollow journal a rubber head, a metal head, a bisected sleeve and tube. The tube is provided with collars. The tube is combined with a grooved head and slotted standard. There are a screw, screw sleeve, flange, washer, key, and wheel for adjusting the rollers. Wheels are enclosed within a casing, and steam is applied to the outside of the same. An adjustable triangular block is arranged between the said wheels to divide the steam. He uses a boiler provided with a flange and screw threads at each end, in combination with heads having on their inner sides an inner and an outer screw flange. A central tube is screwed into the heads of the boiler. He uses a safety-valve with a slotted tube, a grooved seat, and screw cover. He also uses an auxiliary boiler provided with tubes connecting with the hollow rollers and with the main boiler.

ELECTRO-MAGNETIC ENGINE.—The invention of Mr. E. GASSETT, of Boston, U.S., consists in a series of electro-magnets arranged radially in a frame in combination with a series of radial arms placed on one or both sides of the same, and connected with a shaft which operates a circuit breaker for successively making and breaking the electric circuit through the several electro-magnets as the shaft revolves. The said invention also consists in making the frame which supports the electro-magnets adjustable around the central shaft, whereby the relative position of the electro-magnets with respect to the radial arms when the electric circuit is broken may be varied.

IMPROVED VALVE MOTION.—Mr. WILLIAM LIVINGSTONE, of Brooklyn, U.S., obtains an alternate motion of a slide-valves by means of a curvilinear groove plate operated by the piston rod and rock lever connected to the valve rod. The said groove plate may either be fastened to the piston rod or cylinder head, or the long arm of the rock lever may carry the groove plate.

SOLIDIFYING CASTINGS.—The invention of Mr. J. B. TABB, of Fairhaven, Massachusetts, consists in arranging a hydrostatic cylinder and piston driving a plunger, so that the plunger enters (from below) a mould into which liquid or semi-liquid metal has been poured. The mould is firmly bolted to a bed plate, through which the plunger passes, and is closed by a tightly fitting cover, which is screwed down in its place. The plunger being below the moulds, they can readily be filled and removed as required. They are not however to be quite filled, so that the body of metal will be lifted and condensed against the cover and sides of the mould. By thus moving upward, the mass of metal is prevented from adhering to the sides of the mould, which taper slightly downwards. The plunger may be cylindrical, or prismatic in cross section, and in the upper side of the bed plate through which it passes is made a recess, containing a collar formed of radially moving sections held in their places by bolts and pressed against the plunger by springs. This collar prevents the melted metal found escaping round the plunger, and also accommodates itself to the expansion and contraction of the latter. Pipes are attached to the hydraulic cylinder above and below the piston, and are connected by means of three-way cocks either with a hydrostatic pump, or with an elevated tank, so that the piston and plunger may be made to move either upward or downward as required.

MINING GLOSSARY.—The third edition of the Glossary of Mining and Smelting Terms has now been printed, and contains carefully-compiled lists of the technical terms used in the mines of Cornwall, Derbyshire, South Staffordshire, Newcastle, and Spain; and of the smelting terms used in France and Germany. The book, which will be found extremely valuable to those interested in mines desiring thoroughly to comprehend the agents' reports, will be forwarded from the *Mining Journal* office, 26, Fleet-street, E.C., on receipt of 2*s.*, or may be obtained, by order, through any bookseller or newsagent.

THE INVENTOR OF IRON SHIPS OF THE BRITISH NAVY.

Probably there is no class of men in the United Kingdom—and we desire to state only that which is just, loyal, and true—that have of late years exercised a larger-hearted charity and more chaste benevolence than the ironmasters, mineral landed proprietors, and others interested in the consumption of the hardest and most useful of all the metals in lieu, most emphatically, and by way of special excellence, of wood or timber, for purposes of shipbuilding. With these facts before us, and knowing their reverence for justice as between man and man in all matters pertaining to the business of human life, we feel no hesitation in such circumstances to request their kind sympathy and interest, with a view to some *practical* rendering of efficient aid and pecuniary assistance to a great sufferer in the cause of Right against Might—in other words, the much-wronged Inventor, Patentee, and Designer of Great Britain's Iron Navy for the long period of twenty years.

The case of Mr. JOHN CLARE—to whom, of course, we distinctly wish to allude, in common with other journalists who have recently drawn attention to his life-long misfortunes in seeking some kind of redress—has been repeatedly before the House of Commons, Lord Chief Justice Cockburn, Mr. Arnold, of the Westminster Police Court, and other tribunals. Competent engineers, master mariners, eminent iron shipbuilders, &c., have declared on oath, and proved their statements in presence of legal authorities and upon recorded scientific testimony above all manner of suspicion and reasonable doubt, that the original drawings from which the Erebus, Terror, and Thunderbolt were taken in 1855, also the precise model and very designs from which the Warrior and subsequent iron vessels for the Royal Navy have been really copied, are *the patented inventions of Mr. Clare himself, now his private property*, with accurate dates recorded on them, as positively admitted to be true by the Admiralty themselves at the celebrated trial Clare *v.* The Queen, as well as on many previous and subsequent occasions. In point of fact, no scientific or mechanical comparison can be fairly made that does not indisputably prove to any impartial mind that Mr. Clare is the registered patentee, and hitherto unrewarded inventor, of the best framing of iron vessels the world over, and that in the Warrior, to go no further in this direction, the longitudinals and verticals mathematically intersect each other in true scientific combination, and the entire magnificent framework is totally independent of the plates and the like. Suffice it to state, without going into detail on the present occasion, that the whole country is indebted to Mr. Clare at this moment, in common with the debt of Mr. Gladstone's Liberal Government (and let it never be forgotten both are Liverpool men), for England's life-preserving ships, hydrodynamically developed upon sound metallic principles, and now forming the national defences afloat of all the health, wealth, and happiness of each native hearth and home.

Now, it is useless to enlarge upon these matters. Several daily papers in the metropolis and some of the more influential in the provinces, not to mention ourselves, together with a variety of articles—"Our Murders at Sea," &c.—in different reviews, magazines, quarterlies, and other periodicals have one and all *upheld* the just claims to remuneration on the part of Mr. Clare—in fact, no Ministry, Whig, Tory, or Radical, have yet ventured to question or deny them; and it remains to be seen what now shall be done by the rich and powerful representatives of the Iron Trade to render justice to whom justice is *eerdue*, by immediate practical consideration of the case, and deal with it as to them shall seem best, whether such aid be moral, legal, or monetary. The virtues of giving to every man what is his natural right or lawful due, rectitude in the transactions of merchants with each other, conspicuous general honesty, and marked genial integrity characterise ironmasters, not only in commerce universally at home and abroad, but in mutual daily intercourse for purposes of *just* dealings in the highest and best sense of impartiality, equity, and agreeableness to right; the virtue, we repeat, belongs to them of redressing injustice by every legitimate means at their command, and will be brought to bear, we doubt not, in their strongest force, in order to enable Mr. Clare to obtain pecuniary relief, by public and private subscriptions, if desirable,—at all events, to show their respect for Queen Victoria's sign-manual, in his custody. "Let right be done" to the Inventor and Patentee of Her Majesty's Iron Ships—now wronged of a large private fortune in defence of the public welfare.

METAL-COATED SHEET IRON.

An improved method of protecting iron from injury and deterioration has been introduced by Mr. B. MORRISON, of Philadelphia, whose invention consists in deoxidising the scale oxide adherent to sheet-iron, and amalgamating, blending, or, intimately uniting with it any of the softer and more fusible metals, so as to render such scale oxide more flexible, soft, adherent, and less liable to rust, and the sheet-iron also more perfectly annealed and flexible. It is essential that the sheets be made of the best charcoal bloom iron, and that the scale oxide thereon be even, or of uniform thickness and unbroken; and in order to produce such a scale oxide it is recommended that the usual rough and imperfect scale be removed—by means of a weak acid, in the usual manner practiced in the process of coating sheet-iron with zinc by immersion—and that the sheets be then passed between a pair of smooth pressure-rolls, and finally subjected to a sufficient heat to produce thereon a new and uniform scale oxide. Having an iron box prepared of sufficient capacity to hold a number of the sheets slightly isolated from each other, and provided with a lid or cover, and also with a hole near the bottom of one end for the insertion of a gas-pipe, place the sheets successively in the box, isolating them by means of numerous small fragments of hard-burned clay or other suitable incombustible material; apply the lid, and lute the intervening joints with plastic clay. Now place the box in the chamber of a furnace adapted to gradually bring it up to a low or scarcely visible red-heat; insert the nozzle of the gas-pipe into the hole in the box, and introduce hydrogen gas under a pressure about equal to the propelling power required for the illuminating gas of cities. As the clay dries it shrinks, and leaves cracks or fissures sufficient for the slow escape of the compressed gas and the aqueous vapour produced by the combination of the oxygen of the scale and the hydrogen. In the course of an hour the scale oxide will have become deoxidised, and the box may then be withdrawn from the hot chamber and allowed to cool gradually—the hydrogen in the meantime continuing to pass through it as before, to preclude the entrance of atmospheric air.

After the sheets have become cool enough to handle, the gas is turned off, and the sheets are ready for further treatment. Having prepared saturated or strong aqueous solutions (say) of sulphate of zinc, chloride of zinc, chloride of tin, acetate of zinc, acetate of lead, and of any other readily fusible metal that will amalgamate, unite, or combine with the deoxidised scale on the iron at a strong or bright red-heat under the hydrogen or carburetted hydrogen gas, immerse the deoxidised sheets in either one or a mixture of two or more of the said solutions for five or ten minutes, or apply the same by rubbing it on by means of a sponge or soft brush; let the excess of solution drain off, and the remainder crystallise or dry upon the surface of the sheets. Now replace them in the box in the same isolated manner before described; replace and lute the cover, and place the box in the heated chamber of the furnace; then introduce the hydrogen gas, and slowly heat up to a scarcely visible red, maintaining the said low heat for (say) half an hour, more or less, to allow a perfect reduction of the oxide of the applied solution; after which the heat should be increased to a bright red, or heat a few degrees above that which may be required to fuse the now reduced softer metal, and cause the same to amalgamate, blende, or unite with the deoxidised and, consequently, soft and porous scale on the sheet-iron. The box may now be withdrawn from the hot chamber of the furnace and allowed to cool slowly, with the hydrogen gas continuously passing through it to preclude the entrance of atmospheric air until the sheets have become cold enough to be handled, when the gas should be shut off and the sheets taken out of the box.

To obtain brightness of surface when desired it is proposed to pass the sheets severally between and in contact with a pair of cylindrical rapidly rotating bristle brushes; and, if afterward intended to be put up in packs for storage or shipment, the sheets may, as a further protection against dampness, be dipped into any suitable hydrocarbon oil, and then the superfluous portion drained or wiped off. The solution of the sulphate or of the acetate of zinc forms, with the deoxidised scale on the iron, an excellent coating. About three parts of the solution of chloride of zinc mixed with two parts of the solution of chloride of tin make, with the deoxidised scale on the iron, an excellent flexible coating of a whiter colour. Three parts of the solution of the acetate of zinc mixed with two parts of the solution of the acetate of lead, and one part of the solution of the chloride of tin make, with the deoxidised scale on the iron, a very suitable coating for sheet-iron intended to be used in the construction of stoves, stove-pipes, coal-hods, &c.; but as the predominant metal in the coating is the deoxidised scale oxide of iron, the number and proportions of the solutions of whatever metals intended to be applied thereto may be increased and varied as the coating desired may require.

To economise time, the process may be expedited by rubbing the solution upon the surface of the scale and drying it thereon before the sheets are put into the box to be deoxidised, thus making one heating sufficient; but, as the deoxidised scale is porous, the solution saturates or penetrates it, and is, therefore, more readily applied than it can be upon the scale oxide; and, besides, there is a certainty in the former case that the scale is thoroughly deoxidised before the softer metals are reduced and fused—a certainty which is of the highest importance, and may not always be attainable during the one-heat process. The oxides of the softer metals may be, if desired, mixed and applied with lard or oil, and carburetted hydrogen gas may be used instead of hydrogen alone; but the persence of carbon not only tends to stain or darken the coating, but also to carbonise the iron.

LONDON GENERAL OMNIBUS COMPANY.—The traffic receipts for the week ending April 21 were 9586*l.* 10*s.* 5*d.*

"FIELD'S OZOKERIT CANDLES."

AWARDED TWENTY GOLD AND SILVER FIRST-CLASS PRIZE MEDALS.

IMMENSE SAVING OF LABOUR

TO MINERS, IRONMASTERS, MANUFACTURING CHEMISTS, RAILWAY COMPANIES, EMERY AND FLINT GRINDERS, McADAM ROAD MAKERS, &c., &c.

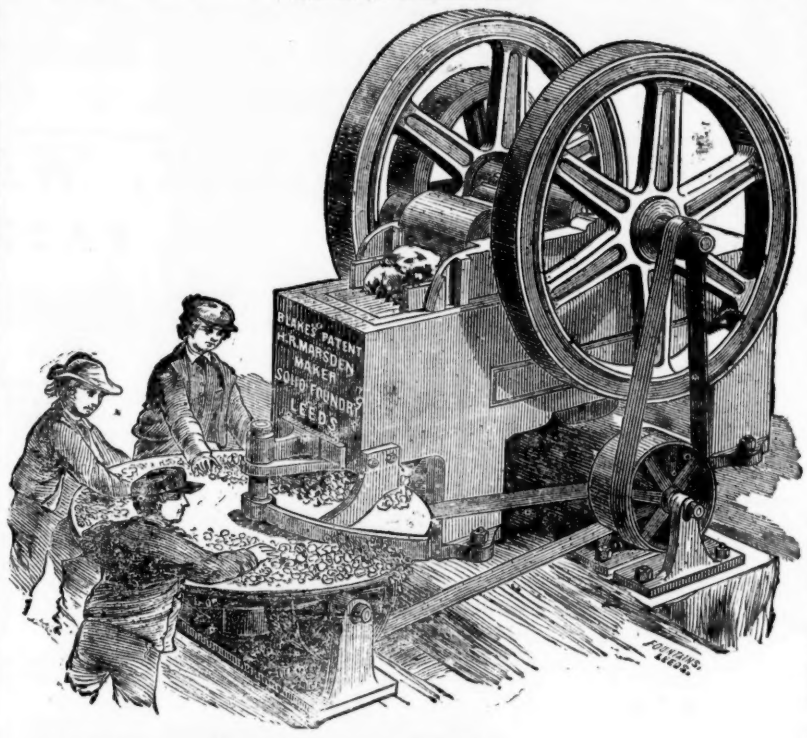
BLAKE'S PATENT STONE BREAKER,

OR ORE-CRUSHING MACHINE,

FOR REDUCING TO SMALL FRAGMENTS ROCKS, ORES, AND MINERALS OF EVERY KIND.

This is the only machine that has proved a success. This machine was shown in full operation at the Royal Agricultural Society's Show at Manchester, and at the Highland Agricultural Society's Show at Edinburgh, where it broke 1½ ton of the hardest trap or whinstone in eight minutes, and was AWARDED TWO FIRST-CLASS SILVER MEDALS. It has also just received a SPECIAL GOLD MEDAL at Santiago, Chili.

It is rapidly making its way to all parts of the globe, being now in profitable use in California, Washoe, Lake Superior, Australia, Cuba, Chili, Brazil, and throughout the United States and England. Read extracts of testimonials:—



The Parys Mines Company, Parys Mines, near Bangor, June 6.—We have had one of your stone breakers in use during the last 12 months, and Capt. Morcom reports most favourably as to its capabilities of crushing the materials to the required size, and its great economy in doing away with manual labour.

For the Parys Mining Company,
H. R. Marsden, Esq. JAMES WILLIAMS.

The Van Mining Company (Limited), Van Mines, Llanidloes, Feb. 6, 1871.—Our machine, a 10 by 7, is now breaking 180 tons of stone for the crusher every 24 hours. I may say, of all our machinery, that for simplicity of construction and dispatch in their work, they are equal to anything in the kingdom, but your stone breaker surpasses them all. W. WILLIAMS.
H. R. Marsden, Esq., Leeds.

Chacewater, Cornwall, Jan. 27, 1869.—I have great pleasure in stating that the patent stone breaker I bought of you some three years ago for mines in Chili, continues to do its work well, and gives great satisfaction. It crushes the hardest copper ore stone—put it through ½ inch size by horse power—with great ease. I can safely recommend it to all in want of a crusher; can be driven by steam, water, or horse power.
H. R. Marsden, Esq. JAMES PHILLIPS.

Terras Tin Mining Co. (Limited), near Grampound Road, Cornwall, Jan. 1871.—Blake's patent stone crusher, supplied by you to this company, is a fascination—the wonder and admiration of the neighbourhood. Its simplicity is also surprising. Persons visiting it when not at work have been heard to remark, "This can't be all of the machine." It will crush to a small size from 8 to 10 tons of very hard and tough elvan rock per hour; taking into its leviathan jaws pieces of the hardest rock, weighing 200 lbs. or more, masticating the same into small bits with as much apparent ease and pleasure as does a horse his mouthful of oats. On every 100 tons of the rock crushed by the machine there is a direct saving to the company of not less than £5 over the process of hand labour previously adopted by them, and the indirect saving much more, the machine being ever ready to perform the duties required of it. It breaks the stuff much smaller, and in form so fitted for the stamps, that they will pulverise one-third more in a given time than when performed by hand labour.
JOS. GILBERT MARTIEN.
H. R. Marsden, Esq., Leeds.

Welsh Gold Mining Company, Dolgelly.—The stone breaker does its work admirably, crushing the hardest stones and quarts. WM. DANIEL.

Ovoca, Ireland.—My crusher does its work most satisfactorily. It will break 10 tons of the hardest copper ore stone per hour.
WM. G. ROBERTS.

General Frémont's Mines, California.—The 15 by 7 in. machine effects a saving of the labour of about 30 men, or $75 per day. The high estimation in which we hold your invention is shown by the fact that Mr. Park has just ordered a third machine for this estate. SILAS WILLIAMS.

Your stone breaker gives us great satisfaction. We have broken 101 tons of Spanish pyrites with it in seven hours. EDWARD AARON.
H. R. Marsden, Esq. Weston, near Runcorn.

For illustrated catalogue, circulars, and testimonials, apply to—

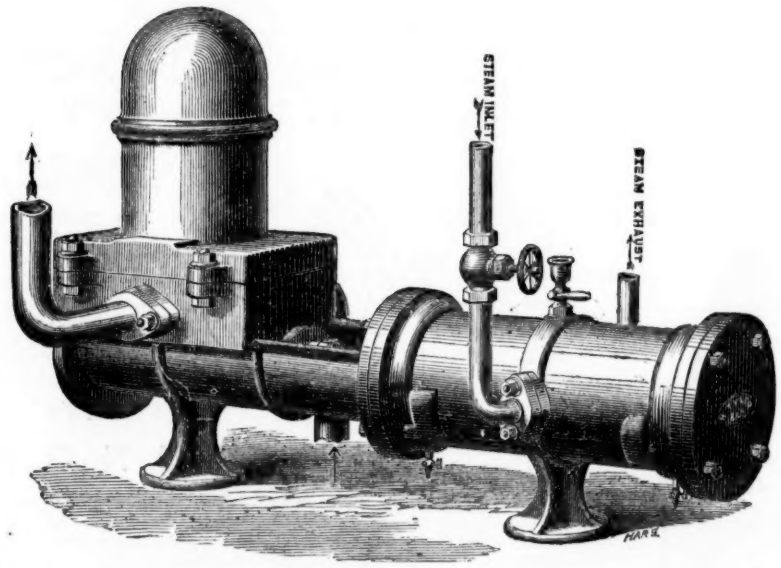
H. R. MARSDEN, SOHO FOUNDRY,
MEADOW LANE, LEEDS,

ONLY MAKER IN THE UNITED KINGDOM.

THE PATENT "UNIVERSAL" STEAM PUMP,

SOLE MAKERS,

HAYWARD TYLER AND CO.,
84, WHITECROSS STREET, LONDON.



The unprecedented success obtained by the above Pumps, owing to their great simplicity and efficiency, induces their (sole) Makers,

HAYWARD TYLER AND CO.,

84, UPPER WHITECROSS STREET, LONDON,

To call the attention of Colliery Proprietors to their use. Numerous testimonials can be forwarded.

TESTIMONIALS.

To Messrs. HAYWARD TYLER and Co., 84, Upper Whitecross-street, London. *Acton Main Coal Company, near Sheffield.*

GENTLEMEN,—In answer to your enquiry, I beg to state that the two "Universal" Pumps supplied to us (through your agent, Mr. T. A. Ashton) are doing our work exceedingly well; we think they are the best in the market, and shall be glad if you will send us another 9-inch cylinder 6-inch pump, one week from this date.

Extract of a Letter from JOHN SIMPSON, Esq, to Hayward Tyler and Co.'s Agent.

Rhos Llantwit Colliery, Caerphilly, near Cardiff, March 4, 1872.

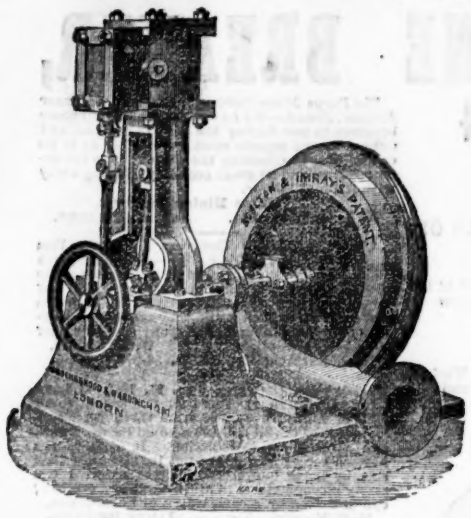
I should like to have the water-piston and clacks the same as in our present pump, as they work exceedingly well, and I do not think it is possible to improve upon the present pump, except by lining the cylinder with brass as ordered.

BROTHERHOOD AND HARDINGHAM,

LATE KITTOE AND BROTHERHOOD, AND FORMERLY WILLIAM FOX,

ESTABLISHED 1824.

PATENT "HELICAL" PUMP.



THE BEST ROTARY PUMP.

ENGINEERS AND MILLWRIGHTS,

Kittoe and Brotherhood's Patent "PARAGON" STEAM PUMPS (Sole Manufacturers).
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IMPROVED GAS EXHAUSTERS.
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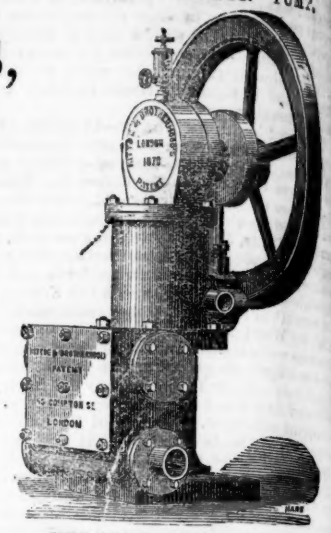
Pumping Machinery of all kinds.

56 and 53, COMPTON STREET, GOSWELL ROAD, LONDON, E.C.

PATENT "PARAGON" PUMP.



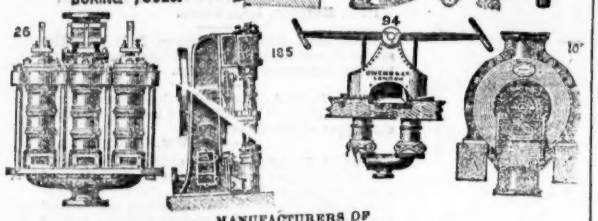
THE BEST DONKEY PUMP.

S. OWENS AND CO.,

Hydraulic and General Engineers,

WHITEFRIARS STREET, FLEET STREET, LONDON.

BORING TOOLS.



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BORING TOOLS, for testing ground for Minerals. Bridge Foundations, Artesian Wells, &c., to any depth.
No. 26.—Treble Barrel and other Deep Well Pumps.
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No. 112.—Single and Double-purchase Crab Winches.
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No. 123.—Bottle and other Lifting Jacks.
No. 94.—Double-barrel Pumps, for Mine or Quarry use
No. 44.—Portable Wrought-iron Pumps, ditto ditto
No. 102.—Bernays's Patent Centrifugal Pumps, of all sizes.

ALSO EVERY OTHER DESCRIPTION OF

HYDRAULIC AND GENERAL MACHINERY,

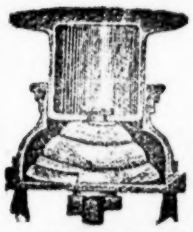
COMPRISING

TURINES, WATER WHEELS, WIND ENGINES, THE HYDRAULIC RAM, FIRE ENGINES, &c.

Catalogues and Estimates on application.

THOMAS TURTON AND SONS,

MANUFACTURERS OF



CAST STEEL for PUNCHES, TAPS, and DIES, TURNING TOOLS, CHISELS, &c.
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DOUBLE SHEAR STEEL	FILES MARKED
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M'TEAR AND CO.'S CIRCULAR FELT ROOFING

FOR

GREAT ECONOMY

AND

CLEAR WIDE SPACE.

For particulars, estimates, and plans, address,—

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CORPORATION STREET, BELFAST.

The above drawing shows the construction of this cheap and handsome roof now much used for covering factories, stores, sheds, farm buildings, &c., the principals of which are double bow and string girders of best pine timber, sheeted with ¼ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 40s. per square, according to span, size, and situation.

Manufacturers of PATENT FELTED SHEATHING, for covering ships' bottoms under copper or zinc.

INODOROUS FELT for lining damp walls and under floor cloths.

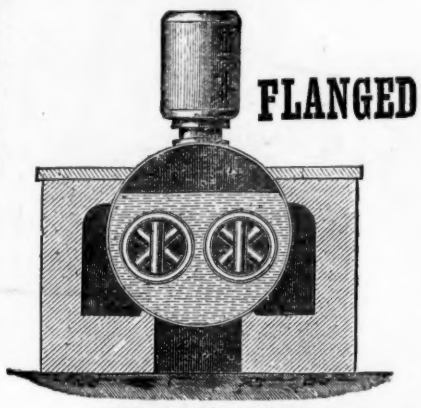
DRY HAIR FELT, for deadening sound and for covering steam pipes, thereby saving 25 per cent. in fuel by preventing the radiation of heat.

PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.

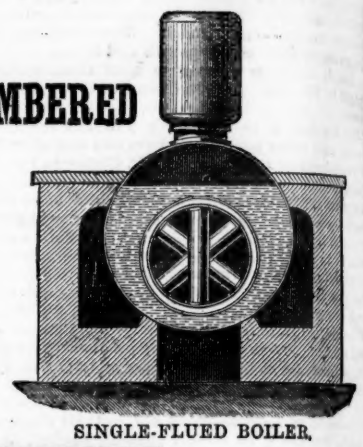
Wholesale buyers and exporters allowed liberal discounts.

PATENT ROOFING VARNISH, in boxes from 3 gallons to any quantity required, 8d. per gallon.

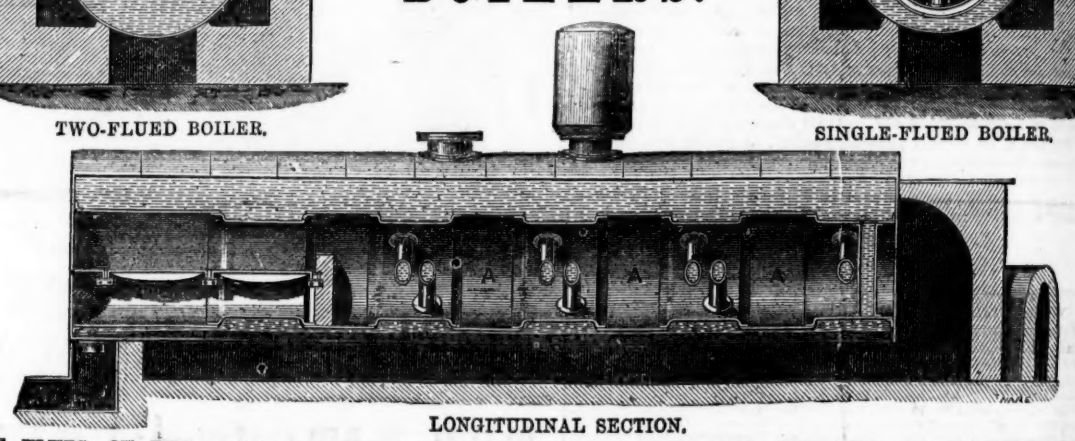
HAWKSLEY, WILD, AND CO.'S PATENT FLANGED & COMBUSTION-CHAMBERED FLUED BOILERS.



TWO-FLUED BOILER.



SINGLE-FLUED BOILER.



LONGITUDINAL SECTION.

THE FLUES OF THE ABOVE BOILERS ARE MADE OF TWO DIAMETERS, ONE RING OF PLATES BEING 4 inches less than the other, alternately.

The smaller rings being flanged, as shown in drawing, are thereby considerably strengthened, besides securing the most material point—a perfect EXPANSION-JOINT.

The cross tubes are placed in the smaller rings of the flue, so that any one can easily be taken out and replaced.

The larger rings of the flue act as reverberating, combustion, and heat-retaining chambers, greatly economising the fuel.

These Boilers are strong, durable, and economical, and have been at work a number of years with the most satisfactory results.

PATENTEES AND MANUFACTURERS:

HAWKSLEY, WILD, and CO., Engineers and Boiler Makers,

SAVILLE STREET EAST, SHEFFIELD.

THE DON ECONOMIC LUBRICATING OIL

IS 40 PER CENT. CHEAPER THAN THE ORDINARY KINDS.

MR. ALFRED HEWLETT, of the Wigan Coal and Iron Company, says:—"I have used it for two years, and find it to answer exceedingly well for lubricating purposes."

MR. NASMYTH, the Inventor of the Steam-Hammer, says:—"I am highly pleased with it as a most effective and durable lubricant, having remarkable properties in the way of setting free bearings which had got set fast."

In face of these and hundreds of other letters to the same effect, it is a MERE WASTE OF MONEY to use the dearer kinds for the engines and machinery of collieries and mines, numbers of which are now using the Don Oil instead.

Any company desirous of trying it before adopting it may do so at our risk and expense.

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PRICE—By the Ton of 253 Gallons, 2s. 6d. a gallon; by the Cask of 40 Gallons, 2s, 9d.

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CHAS. PRICE AND CO.'S RANGOON ENGINE OIL,

AS SUPPLIED TO H.M. DOCKYARDS AND FLEET.

THIS OIL is suitable to every kind of Machinery. As a lubricant it is equal to the best Sperm or Lard Oil, while it possesses the great advantage of being entirely free from any principle which will corrode the metal bearings.

For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

"Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.

"I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is indeed calculated to protect metallic surfaces from oxidation.

"The lubricating power of this oil is equal to Sperm or Lard Oil.

"T. W. KEATES, F.C.S., &c. &c

Every parcel of the Oil sent from the work bears the Trade Mark of the Firm.

LONDON: CASTLE BAYNARD, UPPER THAMES STREET.

WORKS: MILLWALL, POPLAR; and ERITH, KENT

London: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—April 27, 1872.

SUPPLEMENT.

THE MINING JOURNAL,

Railway and Commercial Gazette.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

EXTRACTS FROM DICKER'S "AUSTRALIAN & LONDON GAZETTE."

LONDON, SATURDAY, APRIL 27, 1872.

GOLD AND THE GOLD-FIELDS.

THE gold-mining industry has been steadily pursued in all the different divisions of the colony during the past fortnight, and, as the reports of mining managers and others show, with average success. There have not been any extraordinary instances of new discoveries of quartz reefs or leads of alluvial gold; but, on the other hand, the principal mining claims and mining divisions of the colony are keeping up their yields well, and, what is of great importance, in view of the permanent prosperity of gold-mining in the colony in the future, the business of quartz-mining is receiving week by week more and more attention. Although quartz-mining here may be said to have only gradually become a separate industry from alluvial gold-mining, it has now become so extensive that the yields from it are estimated to surpass those from the older system of alluvial-mining, and the very profitable results derived from it in proportion to the labour employed has led to the most vigorous prospecting in all parts of the colony for reefs. This prospecting has proved beyond doubt that quartz reefs may be said to exist in all neighbourhoods where alluvial gold has been found. The search for these reefs is very often a work of great magnitude and expense. There are many mines now giving excellent yields which were prospected for years before any payable results were obtained, but the reefs are also often found cropping out on the surface, and worked from there to hundreds of feet downwards with profit. It is not always even after reefs are found that success is achieved, as it is sometimes the case that the reef is valueless through not being gold-bearing, or through its containing so little gold that it will not pay to work it, and in either of these cases it has to be abandoned. In this way during the past ten or twelve years many reefs have been deserted, some after yielding fair quantities of gold, and then giving stone which was so poor that it was not considered payable; but lately, owing in part to the improvements in the appliances for obtaining and crushing quartz, and also to the knowledge acquired of working quartz reefs, many of the abandoned claims have been retaken up, and are now furnishing work to large numbers of miners.

There appears to be in the Ballarat district an inexhaustible amount of quartz, the existence of which has been known for years; but the gold returned from quartz in that district has been so small that the reefs there were systematically neglected, under the belief that they would not pay for the working. Within the last twelve or eighteen months, however, since mining in the large rich alluvial claims of Ballarat has not been quite so prosperous as it formerly was, many of the working miners have betaken themselves to the ranges in and around Ballarat, with the view of testing the numerous quartz reefs. In many instances it has been found that quartz may now be obtained and crushed so as to give excellent wages, and if means can be devised by which the stone can be crushed and the gold obtained from it at a smaller cost than at present, employment could be found for vast numbers of miners in the Ballarat district alone. The Ballarat correspondent of *The Argus*, in writing on this subject, says:—"The Dead Horse and White Horse ranges continue to provide employment for large numbers of miners, but if more payable stone could be found there is room enough for fifty times the number now congregated there; the most of these men are working-miners, and a good deal of their gold has to be paid for the carting and crushing of their stone, which costs in all from 2 dwt. to 2¼ dwt., whereas, if a powerful public crushing establishment was erected in their midst, they would all get a decent profit off 2 dwt. stone. There was an excellent idea promulgated some time ago by some persons interested in developing these ranges, namely, to put up a good battery, and only to charge for the crushing of stone to those miners whose quartz would pay for same—that is to say, if a parcel of stone went 4 dwt. or 5 dwt., the crushing cost, say 6*s.* per ton, would be charged, and the balance handed over; if it only went 1 dwt. per ton, the crushing company would keep all the gold, but would demand no more from the miners. This excellent idea has been allowed, however, to fall through; but although it has not been carried out, it is not too late to begin with it."

In the Stockyard Creek district, near Port Albert, in Gipps Land, which is the last newly-discovered gold field of the colony, attention is also being paid to quartz-mining. These diggings were in the first instance alluvial, and many good returns were, and are still being, obtained from the alluvium there, but some rich quartz lodes have also been found that are said to be very rich. Stawell is situate in a portion of the colony quite opposite to and distant from Stockyard Creek, and is a very old gold field. It has now for a number of years been known to possess some excellent quartz mines, and during the last year or two quartz-mining has extended so rapidly and profitably in the district, that although the place is situate 173 miles from Melbourne, there is a population in the borough and shire of 7635 persons. From some statistics collected there within the past few days by the special reporter of *The Argus*, it appears that the quantity of gold altogether raised in this district is 842,803 oz., of a money value of 3,091,011*l.* The great claim of the district is the Cross Reef Mine, which has eclipsed in yields nearly every other mine in Victoria. This company is composed of 10,000 shares, paid up to 2*l.* 2*s.* each, and held by seventy-five persons. The following table shows the progress made in the quantity of stone crushed and gold obtained by this company during the past two years:—

Date.	Tons Crushed.	Yield of Gold.	Dividends.
		oz. dwt. gr.	£ s. d.
Half-year ending—			
June 30, 1870 ...	1,675	3,406 10 8	9,992 1 9
Dec. 31, 1870 ...	7,671	10,452 17 12	28,500 0 0
June 30, 1871 ...	9,402	12,667 11 12	32,230 0 0
Dec. 30, 1871 ...	1,3131	24,495 7 18	73,500 0 0
Jan. 1, 1872, to Feb. 23	2,921	6,154 1 0	19,000 0 0

The average yield of gold is 2½ oz. per ton of quartz crushed, and up to the present date 33,800 tons have been crushed, yielding 57,176 oz. 17 dwt., which, after paying all expenses, has enabled the declaration of dividends amounting to 163,242*l.* The total cost of machinery, &c., has been scarcely over 28,000*l.*, including the price of a new shaft already 500 feet down, which is expected to enable fresh workings to be undertaken at a lower level as well as to drain the claim. Among the shareholders is one who holds nearly one-fifth of the mine. Mr. Duncan M'Kellar, president of Stawell shire, owns nearly one-fourth, and there are several besides who each own one-tenth, one-twelfth, and one-fifteenth. This astonishing wealth is no less due to the quality of the quartz than to its abundance. The proprietors not only have the Cross reef, which is a vertical one, but at right angles there abuts on it the Flat reef, 6 feet thick, and of other dimensions undefined.

In all the intermediate parts of the colony quartz-mining is extending its operations, and so great has been its success at Sandhurst that it would be almost impossible to name the numerous companies now formed or in profitable working there. The Great Extended Hustler's Tribute Mine, the yield from which since October last, when the reef was found, has been of an unprecedentedly large character, still maintains the pride of place as the leading mine of the colony, its last return for the fortnight ending 24th February having been 3146 oz. Only last week, in a new engine shaft which this company are sinking, the reef was struck at a depth of 240 feet, and the discovery is of great value to the shareholders, as it establishes the fact of the rich reef running through so much more of their claim than they were previously certain of. The striking of new reefs in other claims on different lines of reef in the district has caused a great rise in the value of the claims, not only in which the reefs have been struck, but also in adjoining claims in which there is the presumption that the reefs will run and be eventually found and worked profitably.—*The Argus.*

EXTRACTS FROM DICKER'S AUSTRALIAN AND LONDON GAZETTE.

THE MINING JOURNAL, RAILWAY AND COMMERCIAL GAZETTE.

SATURDAY, APRIL 27th, 1872.

LIST of the PRINCIPAL DIVIDENDS PAID in VICTORIA DURING the MONTH ending JANUARY 27, 1872.

Collingwood and Fitzroy Gas Co.,	10 per cent.	per ann. and bonus of 1s. per share	...	£4,500 0 0
Land Mortgage Bank of Australia	10 per cent.	„		5,000 0 0
Melbourne Gas and Coke Co....	8 per cent.	„		9,200 0 0
				£18,700 0 0

ALLUVIAL.

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Annabella, Huntley	0 1 0	Jan. 20	3,100	155 0 0
Argyle, Linton's	0 3 0	„ 20	3,200	480 0 0
Band and Albion Consols, Ballarat ...	0 4 0	„ 6	22,450	4,490 0 0
Band of Hope, Maryborough	0 5 0	„ 27	6,000	1,500 0 0
Bute, Smythesdale	4 0 0	„ 6	40	160 0 0
Golden Gate, Springdallah	0 5 0	„ 6	4,400	1,100 0 0
Golden Stream, Scarsdale	0 10 0	„ 6	2,000	1,000 0 0
Haddon, Haddon	2 10 0	„ 6	64	160 0 0
	2 0 0	„ 20		128 0 0
Seaham, Maryborough	0 1 0	„ 13	6,000	300 0 0
Try Again, Smythesdale	4 0 0	„ 27	23	92 0 0
				£9,565 0 0

QUARTZ.

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Central Garden Gully Tribute, Sandhurst	0 6 0	Jan. 13	2,000	600 0 0
	0 4 0	„ 27		400 0 0
Cornish, Daylesford	0 10 0	„ 20	1,300	650 0 0
Costerfield G. & A., Costerfield ...	0 10 0	„ 27	2,000	1,000 0 0
Eastwood's Quartz, Sandhurst ...	2 10 0	„ 6	1,000	2,500 0 0
	3 10 0	„ 27		3,500 0 0
Ellesmere, Sandhurst	0 0 4	„ 6	14,000	233 6 8
Empire, Sandhurst	0 0 6	„ 27	24,000	600 0 0
Garden Gully United, Sandhurst ...	0 0 6	„ 27	26,422	660 11 0
G. G. Consolidated, Sandhurst ...	0 0 6	„ 6	49,000	1,225 0 0
Golden Fleece, Sandhurst	0 1 0	„ 6	20,000	1,000 0 0
Good Hope Tunnelling and Quartz, Crooked River	0 7 0	„ 13	1,800	630 0 0
Great Extended Hustler's, Sandhurst	0 1 0	„ 13	28,000	1,400 0 0
	0 1 0	„ 27		1,400 0 0
Great Extended Hustler's Tribute, Sandhurst	0 6 6	„ 20	28,000	9,100 0 0
G. V. Brooke Tribute, Sandhurst ...	0 0 3	„ 6	24,000	300 0 0
Harbinger, Dry Creek	0 5 0	„ 6	3,200	808 0 0
Ironbark, Sandhurst	0 1 0	„ 27	9,000	450 0 0
Kitto's Tribute, Sandhurst	0 0 2	„ 27	24,000	200 0 0
Long Tunnel, Stringer's Creek ...	2 10 0	„ 13	2,400	6,000 0 0
Myrtle Creek, Sandhurst	0 0 4	„ 27	20,000	333 6 8
New Chum and Victoria, Sandhurst ...	0 1 0	„ 27	26,000	1,300 0 0
New Chum and Victoria Tribute, Sandhurst	5 0 0	„ 20	800	4,000 0 0
New Fear Not, Daylesford	0 1 6	„ 20	3,600	270 0 0
New North Clunes, Clunes	1 0 0	„ 27	2,056	2,056 0 0
North Cross Reef, Pleasant Creek ...	0 18 0	„ 20	10,000	9,000 0 0
North Gipps Land, Walhalla	0 5 0	„ 13	2,400	600 0 0
North Specimen Hill, Sandhurst ...	0 0 6	„ 6	30,000	750 0 0
Passby, Sandhurst	125 0 0	„ 6	4	500 0 0
Red Jacket, Bright	0 5 0	„ 27	3,000	750 0 0
Royal Oak, Sandhurst	0 0 0	„ 6	24,000	600 0 0
Shenandoah, New Chum, and Belle Vue Tribute, Sandhurst	0 1 0	„ 27	24,000	1,200 0 0
South Extended Monday, Sandhurst...	0 0 3	„ 6	24,000	300 0 0
Victoria Gold Mines, Sandhurst ...	0 1 0	„ 6	20,274	1,013 14 0
	0 1 0	„ 20		1,013 14 0
Victory, Sandhurst	0 0 6	„ 27	30,096	752 8 0
Young Chum, Sandhurst	0 0 6	„ 27	20,000	500 0 0
				57,588 0 4

Dividends paid by Companies other than mining	18,700 0 0
„ „ Alluvial Companies	9,565 0 0
„ „ Quartz „	57,588 0 4
	£85,853 0 4

DURING the MONTH ending FEBRUARY 24, 1872.

ALLUVIAL.

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Argyle, Linton's	0 4 0	Feb. 17	3,200	640 0 0
Band and Albion Consols, Ballarat ...	0 7 6	„ 3	22,450	8,418 15 0
Band of Hope, Maryborough	0 4 0	„ 10	6,000	1,200 0 0
Break-o'-Day, Rokewood	0 5 0	„ 3	3,000	750 0 0
Chapman's Gully, Beaufort	27 0 0	„ 3	5	135 0 0
Galatea, Scarsdale	0 5 0	„ 3	2,100	525 0 0
Golden Gate, Maryborough	0 5 0	„ 3	660	165 0 0
Golden Stream, Scarsdale	0 10 0	„ 3	2,000	1,000 0 0
Haddon, Haddon...	3 0 0	„ 3	64	192 0 0
	3 0 0	„ 17		192 0 0
Hope, Maryborough	0 2 0	„ 24	6,000	600 0 0
Key, Creswick	5 0 0	„ 3	40	200 0 0
Little Stream, Smythesdale	9 0 0	„ 24	14	126 0 0
Royal Saxon, Beaufort	20 0 0	„ 3	5	100 0 0
Seaham, Maryborough	0 1 0	„ 3	6,000	300 0 0
	0 2 0	„ 10		600 0 0
	0 2 6	„ 24		750 0 0
Sedan, Ballarat	4 0 0	„ 17	30	120 0 0
Telegraph, Huntly	0 0 6	„ 10	24,000	600 0 0
United Hand and Band, Ballarat ...	0 2 0	„ 17	25,600	2,560 0 0
Young Duke, Beaufort	47 0 0	„ 3	10	470 0 0
				£19,643 15 0

QUARTZ.

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
All Nations, Blackwood...	1 15 0	Feb. 3	50	87 10 0
Black Hill, Ballarat	0 5 0	„ 10	2,480	620 0 0
Central Garden Gully Tribute, Sandhurst	0 3 0	„ 10	2,000	300 0 0
	0 4 0	„ 24		400 0 0
Cornish, Daylesford	0 10 0	„ 24	1,300	650 0 0
Cosmo, Blackwood	0 1 0	„ 3	1,500	75 0 0
Cross Reef, Pleasant Creek	1 0 0	„ 17	10,000	10,000 0 0
Dividend Quartz Co., Steiglitz... ...	0 4 0	„ 24	3,000	600 0 0
Empire, Sandhurst	0 0 6	„ 10	24,000	600 0 0
Garden Gully Tribute, Sandhurst ...	0 0 6	„ 10	23,750	593 15 0
Golden Fleece, Sandhurst	0 1 0	„ 17	20,000	1,000 0 0
Golden Fleece Tribute, Sandhurst ...	0 0 11	„ 24	12,000	550 0 0
Good Hope Tunnelling & Q., Crooked River	0 5 0	„ 3	1,800	450 0 0

QUARTZ—*continued.*

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Great Extended Hustler's Company, Sandhurst	0 1 0	„ 24	28,000	1,400 0 0
Great Extended Hustler's Tribute, Sandhurst...	0 10 0	„ 3	28,000	14,000 0 0
	0 10 0	„ 17		14,000 0 0
Koch's Pioneer, Sandhurst	0 1 0	„ 17	30,000	1,500 0 0
Lazarus New Chum, Sandhurst ...	0 0 6	„ 24	45,000	1,125 0 0
Long Tunnel, Stringer's Creek ...	3 0 0	„ 10	2,400	7,200 0 0
New Chum & Victoria, Sandhurst ...	0 1 0	„ 10	24,000	1,200 0 0
	0 1 3	„ 17		1,500 0 0
New Chum & Victoria Tribute, Sandhurst	4 0 0	„ 10	800	3,200 0 0
	5 10 0	„ 17		4,400 0 0
New North Clunes, Clunes	1 0 0	„ 24	2,056	2,056 0 0
North Albion, Sandhurst	0 0 6	„ 10	24,000	600 0 0
North Britain, Blackwood	50 0 0	„ 3	4	200 0 0
North Gipps Land, Walhalla	0 10 0	„ 10	2,400	1,200 0 0
Prince of Wales, Sebastopol	0 2 0	„ 17	8,343	834 6 0
Royal Oak, Sandhurst	0 0 6	„ 10	24,000	600 0 0
Shenandoah, New Chum & Bellevue Tribute, Sandhurst	0 0 6	„ 10	24,000	600 0 0
	0 0 8	„ 24		800 0 0
South Johnson's, Sandhurst	6 0 0	„ 17	24	144 0 0
South Ramrod, Sandhurst	2 0 0	„ 3	24	48 0 0
Unity, Sandhurst	0 0 6	„ 10	20,000	500 0 0
Victoria Gold Mines, Sandhurst ...	0 1 0	„ 3	20,274	1,013 14 0
	0 1 0	„ 17		1,013 14 0
				£75,060 19 0

Dividends paid by Alluvial Mining Companies	19,643 15 0
„ „ „ Quartz „ „	75,060 19 0
	£94,704 14 0

AUSTRALIAN AND NEW ZEALAND DIVIDEND GOLD MINES INVESTMENT COMPANY, LIMITED.

No. 1, No. 2, and No. 3 Series.

The agent in Melbourne writes by this mail :—"On my recent visit to Sandhurst, whence I returned on Tuesday, I visited all the mines your company is concerned in, and on the whole was well pleased with what I saw. Being pressed much for time, I must postpone detailed report until next month. I have done nothing further in the purchase of shares, and am not in a hurry, for a good many stocks are tumbling down in price. Again, some of the stocks I last month had indicated an intention of purchasing, had risen considerably in value before I had time to visit them, and this rise prevented me completing your investments, but I trust to have the money laid out to advantage by next mail. Old Chum, North Johnson, and Central Energetic, have all risen in value."

Total Investments.—No. 1 Series.—Australian.

Date of Purchase.	Name and Locality of Company.	Number of Shares.	Rate per Share, including all Costs, Charges, &c.	Total Amount.
			£ s. d.	£ s. d. £ s. d.
1871.				
Sept. 29	New Moon G. M. Co., Bendigo	120	1 1 1	126 10 0
Oct. 3	Do. do. do.	100	1 1 1	105 8 4
				231 18 4
„ 3	Argus Co., Bendigo	100	0 17 2½	86 0 10
„ 5	Do. do.	200	0 17 2½	172 1 8
„ 30	Do. do.	300	0 19 5	291 5 0
				549 7 6
„ 3	Central Energetic G. M. Co., Lauriston ...	10	0 19 5	99 14 2
„ 6	Do. do. do. do. ...	20	9 14 6	194 10 0
„ 31	Do. do. do. do. ...	25	9 6 1	232 12 1
				526 16 3
„ 3	Victoria Gold Mines Co., Bendigo ...	25	2 19 6	74 7 6
„ 5	Do. do. do. ...	100	2 19 6	297 10 0
				371 17
„ 4	North Specimen Hill G. M. Co., Bendigo ...	400	0 4 10	509 5 3
„ 4	Do. do. do. do. ...	900	0 4 10	
„ 5	Do. do. do. do. ...	400	0 4 10	
„ 7	Do. do. do. do. ...	400	0 4 10	
				509 5
„ 5	South Moon G. M. Co. (Graham's), Bendigo	500	0 6 6	162 10 0
Nov. 6	Call on ditto			162 10
„ 21	Hercules Quartz M. Co., Bendigo ...	200	2 1 1	410 16 8
„ 21	Rose of Denmark G. M. Co., Bendigo ...	400	0 18 11	378 6 8
„ 25	Hope G. M. Co., Wood's Point	300	0 15 8	235 0 0
				3,038 19 2
	Purchased in England.			
	Mariners' Reef Quartz Mining and Crushing Co., Maryborough	500	1 2 3	556 5 0 556 0
	Total Investments to date ...	-	- -	£3,932 3 2

Investments.—No. 2 Series.—New Zealand.

Date of Purchase.	Name and Locality of Company.	Number of Shares.	Rate per Share, including all Costs, Charges, &c.	Total Amount.
			£ s. d.	£ s. d. £ s. d.
1871.				
Nov. 3	Caledonian G. M. Co., Thames River ...	3	132 4 5	396 13 3
„ 3	Do. do. do. ...	1	133 6 8	133 6 8
				530 10 11
„ 16	Shotover G. M. Co., Thames River ...	600	0 9 5	282 10 0
„ 16	Golden Crown G. M. Co., Thames River ...	100	5 11 1	555 8 4
„ 16	Albion G. M. Co., Thames River	107	7 15 7	832 7 5
„ 16	Alburnia G. M. Co., Thames River ...	18	7 15 7	140 0 0
„ 16	Do. do. do. ...	50	8 6 8	416 13 4
				550 13 10
„ 16	Imperial Crown G. M. Co., Thames River...	16	4 14 5	75 10 8
„ 16	Do. do. do. do. ...	24	5 0 0	120 0 0
„ 16	Do. do. do. do. ...	60	5 11 2	333 10 0
				529 0 8
„ 16	Prince Imperial G. M. Co., Thames River ...	10	3 1 2	30 11 8
„ 16	Do. do. do. do. ...	89	2 15 7	247 6 11
				277 18 7
„ 16	Kuranui G. M. Co., Thames River ...	25	1 18 11	48 12 11
„ 16	Do. do. do. ...	50	2 4 5	111 0 10
„ 16	Do. do. do. ...	140	2 15 7	389 1 8
				548 15 5
„ 16	Tokatea Coromandel	115	4 8 10	510 15 10 510 15 10
	Stamps and Transfers	-	- -	16 10 2
1872.				
Jan. 19	Tookey's, Thames River	13	21 13 4	281 13 4 281 13 4
	Total Investments to date ...	-	- -	£4,021 13 6

EXTRACTS FROM DICKER'S AUSTRALIAN AND LONDON GAZETTE.

INVESTMENTS.—No. 3 SERIES.—AUSTRALIA.

Date of Purchase.	Name and Locality of Company.	Number of Shares.	Rate per Share, including all Costs, Charges, &c.	Total Amount.		
			£ s. d.	£ s. d.	£ s. d.	
1872. Jan. 3	New Moon Co., Bendigo	200	1 3 4	233 6 8		
„ 13	Do. do.	100	1 3 4	116 13 4		
					350 0 0	
„ 12	Hope Mining Co., Wood's Point	200	0 15 0	150 0 0	150 0 0	
„ 12	Hercules Q. M. Co., Bendigo	150	1 16 8	275 0 0		
„ 24	Do. do. do.	50	1 13 11	84 15 10		
					359 15 10	
„ 17	Rose of Denmark Co., Bendigo	200	0 16 8	166 13 4		
„ 19	Do. do do.	100	0 16 8	83 6 8		
					250 0 0	
„ 19	North Johnson's Co., Bendigo	100	1 10 0	150 0 0	150 0 0	
	Total Investments to date ...	-	-	-	£1,259 15 10	

THE MINES.

THE WINTER'S FREEHOLD GOLD MINING COMPANY, LIMITED, BALLARAT, *29th February*, 1872.—*Mine Report, No. 1 Shaft.*—During the past month the ground to the north and west has been steadily opened up. In the west low level, in a line nearly south from the Hand and Band, a bore went through at 20 feet, with signs of deep ground and wash. A jump-up has been started at this point. The south main low level has been again pushed ahead to meet the No. 3 Consols run, which is expected to enter the property a little to the north of the Smyth's road. This run is very rich, the Consols got over 150 oz. per day from it, and we have every reason to suspect that they have followed it into our land. Steps are now being taken to ascertain if any encroachment has been committed, and all the directors and officers of the Consols have been served with notices that we shall hold them criminally liable if any gold has been abstracted, either from our property or the roadways bounding it. The gold returns show the yields are improving. *Mine Report, No. 2 Shaft.*—The tributors have broken into No. 5 Consols, and cut them off; the gutter looks very promising to the northward. You will see they are again getting gold. P.S.—Report just in; struck wash from the No. 2 rise nearer the shaft:—

Gold Report—No. 1 Shaft.

1872.	oz.	dwt.
Feb. 1 ...	49	7
„ 3 ...	33	6
„ 6 ...	30	19
„ 8 ...	18	18
„ 10 ...	32	2
„ 13 ...	25	0
„ 14 ...	14	0
„ 16 ...	30	0
„ 17 ...	24	6
„ 20 ...	28	7
„ 22 ...	27	1
„ 24 ...	33	4
„ 27 ...	25	1
„ 29 ...	35	12
	407	3

No. 2 Shaft.

1872.	oz.	dwt.	oz.	dwt.
Feb. 1 ...	22	4		
„ 8 ...	24	2		
„ 15 ...	20	13		
„ 22 ...	15	2		
„ 28 ...	34	5		
			116	6

Total.

	oz.	dwt.	oz.	dwt.
No. 1 ...	407	3		
No. 2 ...	116	6		
			523	9

MARINER'S REEF COMPANY WORKS, MARYBOROUGH, VICTORIA, *28th February*, *1872.—Mine Report.*—During the month ending the 17th instant, the shaft has been cut down a further depth of 34 feet, making the total from shaft top 252 feet (say to date, 260 feet). At 240 feet we went through a very small vein of quartz carrying gold in one part of it, which is worth being opened out at some future day. Robson & Co. have sunk 7 feet total depth, from surface 180 feet, and driven west 22 feet. They have also cut into the west a little above the 180 feet, where they have stone, but not yet paying. Tonkin & Co., who have taken a tribute in the recently purchased Phœnix Claim, are driving west on very likely looking ground, and are in from shaft, say 30 feet. During the month, we let a fresh contract for the supply of firewood for twelve months for 4*s.* 6*d.* per ton, 4*d.* less than the former one; we also accepted the tender of Watts & Co., for the supply of sundry castings, &c., for engine shaft. The secretary writes:—The mine manager is pushing on the sinking of the shaft with all the vigour possible.

The MARINER'S REEF has had an offer from a party of miners to work their tailings on tribute, giving the company 10 per cent. of the gross yield of gold. The offer is under consideration.

VICTORIAN MINES.

GREAT EXTENDED HUSTLER'S GOLD MINE CO., BENDIGO.—We are not in a position to give any account of the sinking of the shafts, with the exception of that worked by the Extended Hustler's Tribute, and which is the wonder of this colony. This shaft was sunk by the Hustler's Hill Company (Black, Powell, and others) to within 40 feet of the great reef. These men are now only in the positions of miners and mechanics. Forty feet more, and they would have been worth nearly half a million! Can there be anything more fraught with romance than this? And what a lesson it should be to those who are fainting under the burden of calls. "Another foot, and fortune may be gained," should be the watchword of all quartz miners. When Tuff and Joseph obtained such good results from the western leader, named after them, the attention of the claimholders was drawn to that side, and a number of shafts sunk to catch the run. Smith and Scott, the next claim, got it, and it yielded pretty fairly in their claim. A great deal of trouble, however, took place in regard to drainage, and in the year 1865 an amalgamation of the different claims, from Latham and Watson's to Barkly Terrace, was effected. The claims which amalgamated were (beginning at Latham and Watson's, or Hustler's claim), the Ulster (Carr and Co.), which had some good returns from the stone in their ground; the Londonderry (Stewart and Co.); the Garibaldi, which occupied the position of the Extended Hustler's present main shaft—from this claim the great bulk of all the Extended Hustler's Company's gold has been taken, and the principal shareholders, in which were Messrs. Kennedy (now Crown Lands Bailiff) and M. J. Daly, carpenter; the Galway (Kennedy, Campbell, and Daly); the Alabama (Carr, Stewart, and Kay), on whose ground the Extended Hustler's are now sinking to catch the Extended Hustler's Tribute stone, or rather trying the shaft of the Alabama Company, to get it; the Hustler's Hill (Black and J. Powell), whose shaft is now being worked in by the Extended Hustler's Tribute; R. O. Smith and Scott's, in whose ground the Extended Hustler's are now sinking an engine-shaft; and further south, Tuff and Joseph's. For this latter claim, Mr. Hawkey, who had purchased it from Tuff and Joseph, received 4000 shares in the Extended Hustler's Company. He had paid Tuff and Joseph 900*l.* If he had held his interest to the present date, he would have received over 100,000*l.* for the investment of 900*l.* for seven years. Prior to this the South Hustler's, as the company was then known (being in 23,100 shares) had erected machinery on Smith and Scott's claim, and tried for Tuff and Joseph's reef. This made the shares rise, and in July, 1865, they were quoted at 11*s.* As the stone in Smith and Scott's did not pay, the company resolved to go down to the Garibaldi claim, and erect machinery there and go down to a depth of 500 feet, for as the reef dipped to the north the ground would drain better by that means. While continuing the sinking of this shaft they worked the eastern leg of the reef that cropped up in the Garibaldi claim. This reef had the cap on the surface, and the eastern leg was the largest and more permanent. However, the company were all this time working in the dark, and instead of seeking for new makes of stone, when they got down to a depth of 500 feet they drove into the east and cut the eastern leg of the top reef. They worked it, but not very successfully, as, although it was rich, the reef was so small, and the ground so hard, that they could not make it profitable. In working it down, however, they had some dividends. In such a manner the Extended Hustler's worked on, getting into debt and making shareholders feel very much afraid about its prospects. The shares fell to 4*s.* or 5*s.* All this while Latham and Watson were obtaining great yields, but owing to these not being published the Extended Hustler's and the district suffered. It was not until the close of 1869 that the work, which made the Extended Hustler's the leading gold mining company of Australia, and tended to raise Sandhurst to the position of the first goldfield on this continent, was commenced. We believe that to Mr. Burnside, one of the directors, is due the first idea of putting in a crosscut to the west, then untried ground. Whoever initiated the matter, the crosscut was put in, and in December, 1869, was struck that rich body of stone that re-awakened mining enterprise in Bendigo, and raised many a man from a position of dependence to influence and affluence. Strange to say, had the crosscut been put in 10 feet lower down, the lode would have been missed, and the company would have deserted the western ground, in the opinion that it was barren. All the Hustler's bodies of stone rise coming south, and taper away to nothing. This was like the rest, and where first struck was quite thin, but gradually widened going north until it became 60 feet wide. The excitement about the shares has been so recent that all will recollect it. The shares rose to 2*l.*, then to 4*l.*, and then to 6*l.*, 7*l.*, and 8*l.* Their value at the present time, including all tributes, is 17*l.* 6*s.* The present value of the claim is about 476,000*l.* Taking the value in round numbers as 500,000*l.*, the value of the ground per yard (500) is 1000*l.*, double the valuation put on the Garden Gully reef, 500*l.* per yard.

CENTRAL ENERGETIC, LAURISTON, *February 19th*, 1872.—Commenced crushing on February 1. Started a rise in the backs of the old 100-feet level. Have seen some good stone, but very patchy. The lower stone is showing more gold as we go south. Yield for fortnight, 49 oz.

COLLMANN AND TACCHI'S REEF COMPANY, *February 26th*, 1872.—The cleaning up on Saturday, the 17th inst., resulted in a yield of 326 oz. amalgam. We propose to defer retorting until Saturday next. At the back of No. 12 level the spurs have increased in number and thickness. We are now intersecting them from that level. Some splendid stone bearing heavy gold has been met with. Twenty-eight tons of pyrites have been recrushed for a yield of 8 oz. 5 dwt. gold. The machinery is in excellent working order.

COSTERFIELD GOLD AND ANTIMONY COMPANY, *February 12th*, 1872.—The manager (Mr. Thomas Lang) reports:—During the past fortnight 58 tons of stone yielded 32 oz. 10 dwt. of gold; 52 tons of antimony ore were obtained. The shaft on the lode has been sunk 6 feet; lode 12 inches wide. The 230-feet level has been carried north 18 feet, and a splendid reef 4 feet wide, containing ore and quartz, has come in.

February 26th, 1872.—During past fortnight 73 tons of stone yielded 49 oz. 12 dwt. of gold; 50 tons of antimony ore were obtained. The underlie shaft has been sunk 7 feet, and slabbed 15 feet. It is now down 72 feet; lode 1 foot wide. In the 230-feet level the lode is 5 feet wide, principally quartz, but not rich in gold; this drive is in 30 feet north from crosscut.

ENERGETIC, LAURISTON, *February 19th*, 1872.—Progress during the past fortnight:—Bottom drive has been driven a further distance of 19 feet; total distance south from crosscut, 111 feet. In this drive at present the ground is tight, and the reef rather thin. Stopped for the present, for the purpose of rising through to the 170-feet level, for convenience of air and stoping the backs. Rise is up 24 feet, and am happy to state it is improving both in width and quality. We are also driving a crosscut east at 230-feet level; this will prove that side of the claim 60 feet deeper. It is not in 28 feet. I expect to see a payable reef when struck, at this level. Yield for fortnight, with four heads, 52 oz.

HERCULES COMPANY, *February 12th*, 1872.—Yield for the fortnight, 90 oz. 14 dwt. I attribute the small size of the cake to having taken the stone wider this fortnight than we did last. The levels have been extended 90 feet south, and the same distance north, which latter one shows gold, and gold is also showing on the backs. The contractors have sunk the engine-shaft 12 feet the last fortnight, making it 20 feet from the plat.

HERCULES COMPANY, *February 26th*, 1872.—Yield for the past fortnight 64 oz. 15 dwt. The stone during the last eight or nine days has been very much mixed up with sandstone. There appears to be a run of sandstone all along the backs from the end of 440-feet level, commencing at the end of the crosscut there and running north through the present stopes. The south level has been extended 21 feet, making a total of 111 feet. The crosscut east at the 480 feet level has been driven four feet, making a total of 10 feet. There is a little gold showing in the north level. The contractors have sunk the engine-shaft 7 feet 10 inches this last fortnight. The machinery is all in good working order. We have let a contract for breaking the quartz.

HOPE, WOOD'S POINT, *February 12th*, 1872.—The new shaft is down 105 feet 6 inches below the tunnel. Sunk since last report 2 feet. The ground still continues as unfavourable for working. The small leader out of Hope Reef, lower block, still shows well. Some coarse gold is seen in Hope Reef, upper workings; stone payable. The new reef below the 300-feet level looks rather better than last crushing. The contract for extension of the 300-feet level on new reef will be finished this week, and there seems to be little prospect of any improvement before the termination of contract.

February 22nd, 1872.—Cleaned up on the 16th inst. Yield, 57 oz. 7 dwt. from 167 tons, and 24 oz. 9 dwt. from surface reef tribute—total, 81 oz. 16 dwt. The contract for driving the 300-feet level was finished on Saturday. At the end of the drive a new splice of stone was made in the floor 18 inches in thickness, containing gold, the first that has been seen for 40 feet; the drive is going on to test it farther. The small leader is not so good. No change in the other stopes. The shaft has been sunk 2 feet farther: depth, 107 feet 6 inches.

NEW MOON COMPANY, *February 26th*, 1872.—The manager (Mr. W. Vinton) reports:—The work at present is carried on by contract, viz., two drives on spurs cut in sinking the new shaft, and crosscut west 240-feet level to cut the western reef, which paid so well two years since; also sinking the engine-shaft, which is now down 30 feet below the 240 feet plat. The shaft-men met with an accident last week, and broke the door-piece of the draw-lift, but having a spare one on hand, it was soon repaired, and will start again on Sunday night.

NORTH JOHNSON'S COMPANY, *February 26th*, 1872.—During the week very rich stone has been gone through in the winze. The sinking of the shaft the requisite depth for the next level is almost completed. The appearance of the mine generally is very promising.

NORTH SPECIMEN HILL COMPANY, *February 5th*, 1872.—No. 1 stope is now worked out; No. 2 stope shows a little gold; No. 3 stope in opening out shows gold in moderate quantities. Three shifts will now be put on in the west winze to break through to the bottom level with all expedition; three runs of stone have been struck in sinking, all showing gold. Four men will be put on to drive south from bottom crosscut on the three runs of stone which were reported struck in driving; 52 loads of quartz crushed for a yield of about 10 oz. of gold.

ROSE OF DENMARK COMPANY, *February 19th*, 1872.—We have crushed 177 loads of stone for a yield of 86 oz. 17 dwt. The shaft is down 49 feet 6 inches below the plat. From appearances, and the proximity of water, the mining manager is of opinion that he is close to stone. Men are still breaking stone from the backs.

SOUTH NEW MOON TRIBUTE COMPANY, *February 5th*, 1872.—*Directors' Report.*—Since last general meeting of your company the shaft has been put down to the depth of 170 feet. When at the 127-feet level, we opened out a crosscut to cut again some spurs gone through in sinking; the said spurs were prospected, but after a very fair trial, we considered it advisable to continue sinking. We may mention that the stone gone through in the shaft and crosscutting is the same in appearance as that from which Mr. Graham got such good returns—from 1½ oz. to 2 oz. per ton, up to our boundary. We are happy to inform you that we have secured the services of Mr. Hunkin, Mr. Graham's late manager, as mining manager, and shall commence driving at once for

the stone which he so successfully worked in Mr. Graham's claim, and for which he (Hunkin) considers we are deep enough. He expects to cut the stone in about 20 feet, driving easy. We believe that the call now made will carry us to golden stone.

VICTORIA REEF GOLD MINES COMPANY, *February 12th*, 1872.—This last fortnight we have crushed 724 tons of quartz, yielding 431 oz. 3 dwt. of retorted gold, which has enabled the directors to declare the thirty-first dividend of 1*s.* per share. The engine-shaft has been sunk a farther depth of 6 feet, making a total depth of 559 feet. The eastern crosscut at the 489-feet level has been extended 2 feet 6 inches, total 138 feet. The ground is very hard. The prospects of the mine are just the same.

February 26th, 1872.—Since last report we have crushed 556 loads quartz, yielding 283 oz. 12 dwt. We had to stop two batteries to allow time for filling the workings with mullock. The engine-shaft has been sunk 2 feet, ground about the same. We have let a contract for driving 50 feet, at the 430-feet level, on the west spurs. The east cross-cut, 480-feet level, has been driven 2 feet; ground hard granite.

NEW ZEALAND MINES.

CALEDONIAN, *January 20th*, 1872.—220 oz. of retorted gold have been obtained from the general stuff this week, namely, 139 oz. from the Tararu machine, where 30 head of stampers have been working for the company, and 81 oz. from the company's own mill. Compared with that of last week, this return shows a decrease of 18 oz. There are now 1433 oz. of melted gold in the bank, and 808 oz. retorted. Next week, the last of the working month, the specimens will be crushed, and a general clean-up take place. At present there are between 35 cwt. and 2 tons of specimens in the boxes, which amount ought to be largely augmented by the end of next week, as the show of gold in the main face of No. 1 block continues excellent.

January 27th.—Caledonian, 300 oz.; 304 oz.; 350 oz.; 353 oz.; 280 oz.; 238 oz.; 280 oz.; 220 oz.

January 27th.—The monthly clean-up, or rather the first general clean-up and melting that has occurred since work under Captain Richards's management, commenced in the mine on 5th December, was finished on Saturday morning, and, as near as I can place it, has resulted in a total return of 4037 oz. 10 dwt. of melted gold. Last week there were 1433 oz. 5 dwt. of melted gold and 810 oz. of retorted gold to the credit of the company. This week the returns stand thus:—319 oz. retorted gold from Tararu machine, where thirty head are working for the company; and 1692 oz. 10 dwt. obtained from about 2 tons of specimens, and the general stuff crushed at the company's own mill. Total, 2011 oz. 10 dwt. of retorted gold. This, with the 812 oz. on hand, was melted this morning, and afterwards weighed 26,040 oz. 5 dwt., which, plus 2604 oz. 5 dwt., amounts to 4037 oz. 10 dwt.

February 3rd, 1872.—298 oz. have been lodged, making the total for the week 640 oz.

February 10th, 1872.—The general stuff has yielded well this week. The 40-stamper of the Tararu machine, which has been running for the mine, turned out 533 oz. of gold, whilst 374 oz. were obtained from the company's machine: total, 907 oz. of retorted gold. I have to report concerning the mine that the water in the main shaft has increased a little, but as yet not sufficiently to in the slightest degree interfere with sinking.

February 13th, 1872.—Sinking the main shaft steadily progresses, and so far the increase of water is inconsiderable. The lode has been penetrated about 3 feet: that is, the 3 feet of stuff constituting the specimen leader which there rides on the No. 2 lode has been cleared off, and the main body of stone fairly uncovered, and in one or two places just picked into. Water boils up freely from below, but not in sufficient quantity to excite doubts of the feasibility of getting through the lode and sinking the shaft to the next level. Present appearances are all in favour of that being accomplished. As yet the bottom of the shaft is above the level by about 7 feet of the deepest point reached in Tookey's shaft, and so long as the lode in the Caledonian shaft keeps above that point, not much apprehension need be entertained of a swamp out.

January 27th.—Golden Crown, 60 oz.; *m*70 oz. 7 dwt.; 60 oz.; *m*42 oz. 16 dwt.

GOLDEN CROWN, *February 10th*, 1872.—The company retorted to-day, after treating 100 tons of stone, the most of which came from No 2 lode. The return was very light—only 35 oz. 3 dwt. melted gold.

January 27th, 1872.—Tribute 35 oz.; *m*21 oz. 12 dwt.

GOLDEN CROWN TRIBUTE, *February 3rd*, 1872.—Only 5 tons have been crushed this fortnight, the yield being 13 oz. 5 dwt. 12 gr. melted gold.

ALBION, *January 31st*, 1872.—Since I last reported on this mine, the contractors have met with another delay, through the breaking-down of the engine which drove the ventilating apparatus. The damage, however, has been repaired, and the centrifugal fanner is again at work, and keeping the shaft clear of gas. The depth of the shaft is 154 feet, and the country easy to work.

ALBURNIA, *February 15th*, 1872.—The new manager, Mr. Gribble, has decided upon the plan of action to be followed in the future working of this mine. It may be described in a few words, viz., to abstain from touching the lower levels until the main entrances to them and outlets from them are ahead of the work to be done. This means that the main shaft is to be deepened as soon as possible, and connected with the adit which is being driven from the level of the company's battery. The shaft is to be sunk 60 feet deeper, which will take it 30 feet below the lowest level opened in the mine. This will give a strip of reef of the entire length of the claim to stope out, and not only of the reef but of the numerous leaders which intersect the ground, and of which several are highly auriferous. The manager has made a promising commencement in bringing operations under a rigid system, and also that the stone he is breaking out is likely to be payable. This is the more noticeable on account of his operations being of necessity confined to the semi-worked ground above the level of the old Success adit. Several fine blocks of the reef are yet standing there, and these he intends to take out, and also to open and work one or two of the above-mentioned leaders, with the view of keeping the company's machine (20 stampers) going, whilst the main shaft is sinking. Crushing was resumed at the machine on Monday last, and the early take of table amalgam is from 20 oz. to 25 oz. The batteries were finally cleaned up yesterday, and the amalgam is being retorted this afternoon. 150 tons of stone were crushed.

IMPERIAL CROWN, *February 9th*, 1872.—The utmost expedition is being used by the contractor in the erection of the new battery-building. The beds for the batteries and tables have been laid, nearly all the furnace-work erected, and a considerable portion of the weather-boarding nailed on. The boilers have also been bedded and built in, and the smokestack, which is 7 feet 8 inches square at the base, has been pushed up some 30 feet or 40 feet. A large section of the beach below high-water mark has been reclaimed to form a site for the machine, which will consist of eight batteries of five head of stampers each.—Correspondent.

January 27th, 1872.—Kuranui, 350 oz.; *m*429 oz. 11 dwt.

KURANUI, *February 3rd*, 1872.—The return for the fortnight is 329 oz. 7 dwt. of melted gold.

PRINCE IMPERIAL, *January 19th*, 1872.—11 tons yielded 13 oz. 8 dwt.

January 27th, 1872.—Prince Imperial, 11 oz.; *m*13 oz. 8 dwt.; 20 oz.; 5 oz. 14 dwt. 6 gr.

SHOTOVER, *January 19th*, 1872.—A contract has been let for deepening the main shaft 20 feet, the price being 2*l.* per foot less than the last contract. To provide for the extra weight that will be entailed upon machinery, the boiler has been subjected to a thorough overhaul, and although it has been so long in use, only two faulty plates were discovered. These have been replaced, and early to-morrow morning the engineer will be ready to raise steam.

January 27th, 1872.—Shotover Company, 40 oz.; 22 oz.

February 13th, 1872.—The sinking of the main shaft is proceeding satisfactorily. About 12 feet of the last contract have been completed, and the country in hand still looks very well.

January 27th, 1872.—Shotover Tribute, 6 oz.; *m*6 oz. 10 dwt.

TOKATEA, *January 27th*, 1872.—The company are still supplying the New Zealand Company's battery with more stuff than it can crush, and an average of forty tons per diem is now being sent down the tramway to the machine.

January 27th, 1872.—Tokatea Coromandel, 400 oz.; 1680 oz.

January 27th, Tookey Company Tribute, 14 oz.; *m*77 oz. 2 dwt. 12 gr.

TOOKEY'S, *February 6th*, 1872.—Instead of eight feet, the distance to be driven, ere connection is established between the drive from the shaft, and the drive from the Caledonian, is 80 feet. The manager reports that he is about to crush a trial parcel of five tons of stone taken out of a small leader that was cut in the shaft, and has since been cut again in a cross cut driven at the 200-feet level. Gold has been seen in the stone. A trial crushing of the main reef at the Caledonian end of the mine is also to take place shortly. Forty tons of the stuff are ready.

THE BENDIGO GOLD-FIELD REGISTRY, 1872. By JOHN NEILL MACARTNEY, late *Argus* Mining correspondent for Sandhurst, with Plans by H. B. Nicholas, C.E., mining surveyor and inspector. Copies of this work will arrive by the *Somersetshire*, which left Melbourne in January. Price 25*s.*, bound in leather, and 21*s.* bound in cloth.

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